DRAFT
Section 309 Assessment and Strategy

FY 2016-2020

Coastal Zone Management Program
Office of Planning
Department of Business, Economic Development & Tourism
State of Hawaii

February 2015

TABLE OF CONTENTS

ACRONYM LIST

AAL	Average Annualized Loss
ACT	Action Team
ASCE	American Society of Civil Engineers
CDD	Community Development District
CMPs	Coastal Management Programs
CZMA	Coastal Zone Management Act
DAR	Department of Land and Natural Resources, Division of Aquatic Resources
DBEDT	Department of Business, Economic Development and Tourism
DLNR	Department of Land and Natural Resources
DOBOR	Department of Land and Natural Resources, Division of Boating and Ocean Recreation
DOE	U.S. Department of Energy
DOFAW	Department of Land and Natural Resources, Division of Forestry and Wildlife
ENSO	El Nino Southern Oscillation
FEMA	Federal Emergency Management Agency
FIRMs	Flood Insurance Rate Maps
HAR	Hawaii Administrative Rules
HAZUS-MH	Hazards United States Multi-Hazard
HCDA	Hawaii Community Development Authority
HCEI	Hawaii Clean Energy Initiative
HCRS	Hawaii Coral Reef Strategy
HCZMP	Hawaii Ocean Coastal Zone Management Program
HDOA	Hawaii Department of Agriculture
HI-MDAP	Hawaii Marine Debris Action Plan
HRS	Hawaii Revised Statutes
HSCD	Hawaii State Civil Defense
HTA	Hawaii Tourism Authority
IBC	International Building Code
ICAC	Interagency Climate Adaptation Committee
JTMP	Japanese Tsunami Marine Debris
MLCD	Marine Life Conservation District
MOU	Memorandum of Understanding
NARS	Natural Area Reserves
NELHA	Natural Energy Laboratory of Hawaii Authority
NERRS	National Estuarine Research Reserve System
NFIP	National Flood Insurance Program
NOV	Notice of Violation
NPS	National Park Service
OP	Office of Planning
ORMP	Ocean Resources Management Plan
OTEC	Ocean Thermal Energy Conversion
SAMP	Special Area Management Plan
SBCC	State Building Code Council
SCORP	State Comprehensive Outdoor Recreation Plan
SHMHMP	State of Hawaii Multi-Hazard Mitigation Plan
SLR	Sea Level Rise

TLESC	Tsunami Loads and Effects Subcommittee
TOD	Transit Oriented Development
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

INTRODUCTION

The Coastal Zone Enhancement Program encourages state and territorial coastal management programs to strengthen and improve their federally approved coastal management programs in one or more of nine areas. These "enhancement areas" include wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management plans, ocean and Great Lakes resources, energy and government facility siting, and aquaculture. The enhancement program was established in 1990 under Section 309 of the Coastal Zone Management Act (CZMA), as amended.

Every five years, states and territories are encouraged to conduct self-assessments of their coastal management programs to determine enhancement opportunities within each of the nine enhancement areas—and to assess the effectiveness of existing management efforts.

All State and Territory Coastal Management Programs (CMPs) must complete an approved Assessment and Strategy to be eligible for Section 309 funding in FY2016-2020. This Assessment and Strategy has been prepared in order that the Hawaii Coastal Zone Management Program (HCZMP) may be eligible for Section 309 funding in FY2016-2020. The Assessment and Strategy report was developed on the basis of research and interviews with resource people.

The CZMA places a strong emphasis on public participation and encourages the participation, coordination, and cooperation with and among appropriate local, state, federal and regional groups to help carry out the goals of the CZMA. In keeping with the intent of the CZMA, the assessment and strategy is a public document.

At the beginning of the assessment and strategy development process, the CZM Program identified key stakeholder groups to provide feedback in the form of an informal online survey. The stakeholders provided feedback on what they felt are the high priority enhancement areas, the critical problems related to those priority areas and the greatest opportunities for the HCZMP to strengthen and enhance them. This ensured that the priorities and needs proposed in the assessment and strategy reflect more than just the HCZMP staff opinions.

General public participation in the assessment and strategy process was also conducted. During the timeframe concurrent with NOAA review of the draft assessment and strategy, the HCZMP will solicit public participation by posting the draft assessment and strategy document on its public website. The public will have the opportunity to review the draft document and submit comments through the website. Public engagement will include notification of HCZMP constituents and community member through existing email lists as well as posting a notice on the State of Hawaii Office of Planning's Facebook page.

In addition, past and present HCZMP directions and initiatives, HCZMP staff capabilities, and HCZMP expertise and core functions were significant factors in the development of the Strategies.

SUMMARY OF ACHIEVEMENTS

Ocean Resources Management Policies (Adoption as State Policy) and Ocean Resources Management Plan (ORMP) Executive Order

The 309 Strategy for FY 2011-2015 for this enhancement area is to set forth explicit state policy regarding the importance of managing Hawaii's marine and coastal resources because of its economic, environmental, and cultural significance to the State. Specifically, the strategy focuses on getting the ocean resources objectives and policies to be codified in Hawaii's statewide policy document, the Hawaii State Plan. Moreover, the strategy includes the execution of an Executive Order endorsing an update ORMP and an associated framework for purposeful collaborative governance would provide an important mechanism to implement the ocean resources objectives and policies. An analysis and update of the Hawaii ORMP provides the basis for proposed legislation to amend the Hawaii State Plan.

In Years 1-2 of the 309 Strategy, the HCZMP utilized the successful collaborative work of the ORMP partnership to complete the analysis and content for the update of the 2006 ORMP. After completion of two rounds of statewide stakeholder meetings to solicit input into the update of the ORMP a final updated ORMP was completed. In Years 3-4, the activities and achievements included the Governor's formal endorsement of the Plan on July 25, 2013, endorsing the 2013 ORMP and the associated framework for purposeful collaborative governance.

Alternative Financing Plan and Statutory Amendments for Coastal Land Acquisition Financing

The 309 Strategy for FY 2011-2015 for this enhancement area is to research, identify, and adopt innovative funding techniques to obtain, protect, and maintain shoreline access. The program change will amend sections of the Hawaii Revised Statutes (HRS) to enable the use of alternative and innovative financing mechanisms to fund coastal land acquisition at the state and county level. These mechanisms will be authorized in state statutes so that they can be utilized by state and county governments. Amendments to the finance and taxation sections of the HRS and to HRS Chapter 115, Public Access to Coastal and Inland Recreational Areas, will be developed. The revised statutes will expand the financing mechanisms available to state and county governments and result in revised coastal land acquisition and management programs at the state and county level.

Activities in Year 1 of the 309 Strategy were delayed due to various delays in state procurement, strain on HCZMP human resources coupled with numerous priority and time-sensitive projects surfacing. Since the activities of each year are dependent on the completion of the previous year's activities, the subsequent years were also delayed.

During Year 1/Phase 1 of the 309 Strategy, the HCZMP staff obtained consultant services to develop an alternative financing plan for the acquisition, improvement, and maintenance of shoreline public access in accordance. The selected consultant (1) completed a detailed work plan; (2) acquired shoreline access GIS shapefiles from each of the four counties; (3) began initial research and identification of innovative funding mechanisms, tools, and techniques used by other states and local governments to acquire and maintain shoreline public access; (4) formed an interagency advisory committee; (5) convened the first advisory committee meeting to receive feedback on proposed financing principles; and (6) completed minutes of the first committee meeting.

Activities completed in Year 2/Phase 2 included: 1) convening three advisory committee meetings; and 2) completion of the *Alternative Funding Mechanisms for Acquisition, Improvement, and Maintenance of Shoreline Public Access* report (June 2014). The HCZMP has received an extension through June 30, 2015 to complete Year 2/Phase 2 tasks, which include: (1) evaluating the recommendations presented in the final funding plan; and (2) obtaining consultant services, if deemed necessary, to initiate legal research to provide content for the shoreline public access website.

In Year 3/Phase 3 of the 309 Strategy, HCZMP staff will prepare and propose statutory amendments to State financing and taxation statutes in order to implement recommendations in the final funding plan developed in Year 2/Phase 2. This will involve testifying at legislative hearings in support of proposed bill(s); meeting with legislators and advocating for proposed bill(s); and soliciting supportive testimony from stakeholders. The HCZMP will also begin implementation activities by obtaining contractual services to design and test a website for shoreline public access.

If legislation is not adopted during Year 3/Phase 3, the HCZMP will continue to advocate for adoption of statutory amendments during Year 4/Phase 4. If legislation is adopted, the HCZMP will disseminate information to State and County agencies with coastal land acquisition programs and shoreline access responsibilities. The HCZMP will also work with State and County agencies to identify and prepare necessary amendments to administrative rules. Contractual services for finalizing and launching the shoreline public access website will also be obtained during Year 4/Phase 4. In the last year of the 309 Strategy (Year 5/Phase 5), the HCZMP will continue to coordinate with State and County agencies to prepare and adopt amendments to administrative rules to implement statutory changes; update and maintain the shoreline public access website; and disseminate informational material.

ASSESSMENT: PHASE I

Wetlands

Section 309 Enhancement Objective: Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands. §309(a)(1)

> *Note: For the purposes of the Wetlands Assessment, wetlands are "those areas that are inundated or saturated at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." [33 CFR 328.3(b)]. See also pg. 17 of the CZMA Performance Measurement Guidance[1] for a more in-depth discussion of what should be considered a wetland.*

Phase I (High-level) Assessment: *(Must be completed by all states.)*
Purpose: To quickly determine whether or not coastal hazards are a priority enhancement objective for the CMP that warrants a more in-depth assessment to understand key problems and opportunities that exist for program enhancement as well as the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Using provided reports from NOAA's Land Cover Atlas[2] or high-resolution C-CAP data[3] (Pacific and Caribbean Islands only), please indicate the extent, status, and trends of wetlands in the state's coastal counties. You can provide additional or alternative information and/or use graphs or other visuals to help illustrate or replace the able entirely if better data is available. Note that the data available for the islands may be for a different timeframe than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico and CNMI currently only have data for one time point so will not be able to report trend data. Instead, Puerto Rico and CNMI should just report current land use cover for all wetlands and each wetlands type.

Coastal Wetlands Status and Trends		
Current state of wetlands as of 2005 (acres)**		
Percent net change in total wetlands (% gained or lost)*	from 1992-2001	from 2001-2005
	1%	0%
Percent net change in freshwater (palustrine wetlands) (% gained or lost)*	from 1992-2001	from 2001-2005
	1%	0%
Percent net change in saltwater (estuarine) wetlands (% gained or lost)*	from 1992-2001	from 2001-2005
	0%	0%

** Note: Islands likely have data for another time period and may only have one time interval to report. If so, only report the change in wetlands for the time period high-resolution C-CAP data is available. PR and CNMI do not need to report trend data.*
***Note: 2005 is the most recent data obtained by HCZMP for this assessment.*

[1] http://coastalmanagement.noaa.gov/backmatter/media/czmapmsguide11.pdf
[2] http://www.csc.noaa.gov/ccapatlas/. Summary reports compiling each state's coastal county data will be provided.
[3] http://www.csc.noaa.gov/digitalcoast/data/ccaphighres

How Wetlands Are Changing*		
Land Cover Type	**Area of Wetlands Transformed to Another Type of Land Cover between 1992-2001 (Sq. Miles)**	**Area of Wetlands Transformed to Another Type of Land Cover between 1992-2001 (Sq. Miles)**
Development	2.45	6
Agriculture	0.89	0
Barren Land	0.67	0
Water	0.22	8

** Note: Islands likely have data for another time period and may only have one time interval to report. If so, only report the change in wetlands for the time period high-resolution C-CAP data is available. PR and CNMI do not report.*

2. If available, briefly list and summarize the results of any additional state or territory-specific data or reports on the status and trends of coastal wetlands since the last assessment to augment the national datasets.

   The tables above were completed using CCAP data. Data for the time periods requested by NOAA were not available, however this assessment includes the most recent data found available.

   The following documents represent the current reports/plans regarding the State's wetlands:

   (1) Strategic Plan for Wetland Conservation in Hawaii, Jan 2006, Pacific Coast Joint Venture.
   A strategic plan designed to address Hawaii's waterbirds and wetlands in a broad ecosystem management method. By combining multiple strategies across multiple sites this plan describes archipelago-wide conservation goals. (http://www.pcjv.org/hawaii/publications/HWJVStrategicPlan.pdf).

   (2) Hawaii's Comprehensive Wildlife Strategy, Oct. 1, 2005, Department of Land and Natural Resources.
   The strategy identifies species of greatest conservation need and their affiliated habitats. In includes strategies for addressing those needs and the conservation of the diversity of species (http://dlnr.hawaii.gov/wildlife/cwcs/).

   (3) *State Comprehensive Outdoor Recreation Plan* (SCORP), 2008 Update, DLNR, April 2009 (SCORP is being updated now, 2014).
   This is a plan aimed at implementing the goals, objectives, and policies of the Hawaii State Plan, State Recreational Functional Plan, and County General Plans by representing a balanced program of acquiring, developing, conserving, using, and managing Hawaii's recreational resources (http://state.hi.us/dlnr/reports/scorp/SCORP08-1.pdf).

Management Characterization:

1. Indicate if there have been any significant changes at the state or territory-level (positive or negative) that could impact the future protection, restoration, enhancement, or creation of coastal wetlands since the last assessment?

Management Category	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	N
Wetlands programs (e.g., regulatory, mitigation, restoration, acquisition)	N

Although there have not been any significant changes since the last 309 assessment, Act 210 Session Laws of Hawaii (2011) established the Heeia community development district to develop culturally appropriate agriculture, education, and natural-resource restoration and management of the Heeia wetlands. The authority, Hawaii Community Development Authority (HCDA) shall serve as the local redevelopment authority of the district to facilitate culturally appropriate agriculture, education, and natural-resource restoration and management of the Heeia wetlands, in alignment with the Honolulu board of water supply's most current "Koolau Poko Watershed Management Plan" and the City and County of Honolulu's most current "Koolaupoko Sustainable Communities Plan."

Although there have not been any wetland programs (e.g. regulatory, mitigation, restoration, acquisition) since the last 309 assessment, in 2012 the U.S. Fish and Wildlife Service (USFWS) released the *Recovery Plan for Hawaiian Waterbirds* (USFWS, 2011). This recovery plan addresses four species of Hawaiian waterbirds: the Hawaiian duck or koloa maoli (*Ana wyvilliana)*, Hawaiian coot or ala eke oke o (*fulica alai),* Hawaiian common moorhen or alae ula *Gallinula chloropus sandvicensis)*, and Hawaiian stilt or ae o *(Himantopus mexicanus knudseni)*, all federally listed as endangered under the Endangered Species Act. Historically, these four species were found on all of the main Hawaiian Islands except Lanai and Kahoolawe. Currently, Hawaiian ducks are found on the islands of Niihau, Kauai, Oahu, Maui and Hawaii; Hawaiian coots and Hawaiian stilts are found on all of the main Hawaiian Islands except Kahoolawe; and Hawaiian common moorhens are found only on the island of Kauai and Oahu. These endangered Hawaiian waterbirds are currently found in a variety of wetland habitats including freshwater marshes and ponds, coastal estuaries and ponds, artificial reservoirs, kalo or taro (*Colocasia esculenta)* loi or patches, irrigation ditches, sewage treatment ponds, and in the case of the Hawaiian duck, montane streams and marshlands. The most important causes of decline for all four species were loss and degradation of wetland habitat and predation by introduced animals.

The ultimate goal of the recovery program for Hawaiian waterbirds is to restore and maintain multiple self-sustaining populations within their respective historical ranges, which will allow them to be reclassified to threatened status (downlisted) and eventually removed from the Federal List of Endangered and Threatened Wildlife and Plants (delisted). The objectives and criteria of the program are described in detail in this *Recovery Plan for Hawaiian Waterbirds* (USFWS, 2011).

In March 2011, the *Wetland Restoration and Habitat Enhancement Plan*, *Kawainui Marsh* was developed by the State Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW). The Plan identifies improvements planned for a portion of the Kawainui Marsh, located on the island of Oahu, that would consist of: 1) wetland restoration and erosion control for a portion of Kawainui Marsh; 2) habitat restoration for native Hawaiian waterbirds, migratory shorebirds and waterfowl, and native fish species; 3) improvements to support DOFAWs maintenance operations; and 4) some public access to the marsh. Funding for the plan and implementation of restoration improvements was obtained via a grant from the US Fish and Wildlife Service, Harold K.L. Castle Foundation and the State of Hawaii.

In December 2013, DOFAW approved a Final Environmental Assessment for the *Mana Plains Forest Reserve Restoration Plan* for the purpose of habitat restoration and creation of a wildlife sanctuary on the island of Kauai. Restoration of wetland habitat is proposed to enhance DOFAW's conservation and recovery efforts for the four species of endangered Hawaiian waterbirds.

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the change;
    Changes in this enhancement area were not significant and have been summarized in the resource and management characterization sections above.

    b. Specify if it was a 309 or other CZM-driven change;
    None of these changes were Section 309 or other CZM Program-driven.

    c. Characterize the outcomes and/or likely future outcomes of the changes(s).
    Changes in this enhancement area were not significant.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	_____
Low	__X__

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

    The HCZMP defers actions related to wetlands to those agencies with direct authority and resources to address this enhancement area. The management of wetlands falls under the jurisdiction of DLNR's DOFAW. Though the HCZMP supports management plans and actions to facilitate effective protection and use of this resource, the HCZMP defers to DOFAW. Wetlands management is also addressed as a part of the State's *Ocean Resources Management Plan* (ORMP). In addition, results from the stakeholder engagement survey did not indicate that Wetlands were a high priority area.

Coastal Hazards

Section 309 Enhancement Objective: Prevent or significantly reduce threats to life and property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level change. §309(a)(2)

Note: For purposes of the Hazards Assessment, coastal hazards include the following traditional hazards and those identified in the CZMA: flooding; coastal storms (including associated storm surge); geological hazards (e.g., tsunamis, earthquakes); shoreline erosion (including bluff and dune erosion); sea level rise; Great Lake level change; land subsidence; and saltwater intrusion.

Phase I (High-level) Assessment: *(Must be completed by all states.)*

Purpose: To quickly determine whether or not coastal hazards are a priority enhancement objective for the CMP that warrants a more in-depth assessment to understand key problems and opportunities that exist for program enhancement as well as the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Flooding: Using data from *NOAA's State of the Coast* "Population in the Floodplain" viewer[4] and summarized by coastal county through NOAA's Coastal County Snapshots for Flood Exposure[5], indicate how many people were located within the state's coastal floodplain as of 2010 and how that has changed since 2000. You may to use other information and/or graphs or other visuals to help illustrate.

Population in the Coastal Floodplain			
	2000	**2010**	**Percent Change from 2000-2010**
No. of people in coastal floodplain[6]	84,892[7]	114,310[4]	+ 34.65%
No. of people in coastal counties	1,211,537[8]	1,360,301[5]	+ 12.28%
Percentage of people in coastal counties in coastal floodplain	7.00%	8.40%	----------

2. Shoreline Erosion (for all states other than Great Lakes and islands; for Great Lakes and islands, see Question 5): Using data from *NOAA's State of the Coast* "Coastal Vulnerability Index,"[9] indicate the vulnerability of the state's shoreline to erosion. You may use other information and/or graphs or other visuals to help illustrate or replace the table entirely if better data is available. *Note: For New York and Pennsylvania that have both Atlantic and Great Lakes shorelines, fill out the table below for the Atlantic shoreline only.*

[4] http://stateofthecoast.noaa.gov/pop100yr/welcome.html. Note FEMA is in the process of updating the floodplain data. This viewer reflects floodplains as of 2010. If you know the floodplain for your state has been revised since 2010, you can either use data for your new boundary, if available, or include a short narrative acknowledging the floodplain has changed and generally characterizing how it has changed.
[5] http://www.csc.noaa.gov/digitalcoast/tools/snapshots
[6] To obtain exact population numbers for the coastal floodplain, download the Excel data file on the State of the Coast "Population in the Floodplain" viewer.
[7] www.csc.noaa.gov/digitalcoast/dataregistry/#/demographictrends (See *Decadal Demographic Trends for the FEMA SFHA 100 Year Floodplain)*
[8] www.csc.noaa.gov/digitalcoast/dataregistry/#/demographictrends (See *Decadal Demographic Trends for Coastal Portions of US States and Territories)*
[9] http://stateofthecoast.noaa.gov/vulnerability/welcome.html (see specifically "Erosion Rate" drop down on map). The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.

Vulnerability to Shoreline Erosion [10]		
Vulnerability Ranking	**Miles of Shoreline Vulnerable[11]**	**Percent of Coastline[11]**
Very Low (>2.0m/yr) accretion	N/A	N/A
Low (1.0-2.0 m/yr) accretion)	N/A	N/A
Moderate (-1.0 to 1.0 m/yr) stable	N/A	N/A
High (-1.1 to -2.0 m/yr) erosion	N/A	N/A
Very High (<-2.0 m/yr) erosion	N/A	N/A

Data from the U.S. Geological Survey (USGS) National Assessment of Coastal Vulnerability to Sea-Level Rise, and hence NOAA's State of the Coast "Coastal Vulnerability Index," is not available for Hawaii and was therefore not provided in the table above. Please see question 5 below for additional data or reports related to Hawaii's risk and vulnerability to coastal hazards.

3. Sea Level Rise (for all states other than Great Lakes and islands; for Great Lakes and islands, see Question 5): Using data from *NOAA's State of the Coast* "Coastal Vulnerability Index"[12], indicate the vulnerability of the state's shoreline to sea level rise. You may provide other information and/or use graphs or other visuals to help illustrate or replace table entirely if better data is available. *Note: For New York and Pennsylvania that have both Atlantic and Great Lakes shorelines, fill out the table below for your Atlantic shoreline only.*

Coastal Vulnerability to Historic Sea Level Rise		
Vulnerability Ranking	**Miles of Shoreline Vulnerable[11]**	**Percent of Coastline**
Very Low	N/A	N/A
Low	N/A	N/A
Moderate	N/A	N/A
High	N/A	N/A
Very High	N/A	N/A

Data from the USGS National Assessment of Coastal Vulnerability to Sea-Level Rise, and hence NOAA's State of the Coast "Coastal Vulnerability Index," is not available for Hawaii and was therefore not provided in the table above. Please see question 5 below for additional data or reports related to Hawaii's risk and vulnerability to coastal hazards.

[10] Data from NOAA State of the Coast "Coastal Vulnerability Index" is not available for Hawaii.
[11] To obtain exact shoreline miles and percent of coastline, mouse over the colored bar for each level of risk or download the Excel data file.
[12] http://stateofthecoast.noaa.gov/vulnerability/welcome.html (see "Vulnerability Index Rating" drop down on map). The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.

4. Other Coastal Hazards: In the table below, indicate the general level of risk in the coastal zone for each of the coastal hazards. The state's multi-hazard mitigation plan is a good additional resource to support these responses.

Type of Hazard	General Level of Risk[13] (H, M, L)
Flooding (riverine, stormwater)	H
Coastal Storms (including storm surge)[14]	H
Geological hazards (e.g., tsunamis, earthquakes)	H
Shoreline Erosion[15]	H
Sea Level Rise[13,14,15]	H
Great Lake Level Change[14]	N/A
Land subsidence	L
Saltwater intrusion	H
Other (please specify)	N/A

[13] Risk is defined as: "the estimated impact that a hazard would have on people, services, facilities and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage." *Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001*

[14] In addition to any state or territory-specific information that may help respond to this question, the U.S. Global Change Research Program has an interactive website that provides key findings from the 2009 National Climate Assessment for each region of the country and various sectors, including findings related to coastal storms, sea level rise, and Great Lake level change, that may be helpful in determining the general level of risk. See http://nca2009.globalchange.gov/.

[15] See NOAA State of the Coastal Vulnerability to Sea Level Rise Tool (select "Erosion Rate" from drop down box) http://stateofthecoast.noaa.gov/vulnerability/welcome.html. The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.

5. If available, briefly list and summarize the results of any additional data or reports on the level of risk and vulnerability to coastal hazards within your state since the last assessment. The state's multi-hazard mitigation plan or climate change risk assessment/plan may be a good resource to help respond to this question.

National Assessment of Shoreline Change: Historical Shoreline Change in the Hawaiian Islands
Available at: http://pubs.usgs.gov/of/2011/1051/

The University of Hawaii Coastal Geology Group, in conjunction with the USGS, recently completed an analysis of historical shoreline change along the beaches of Kauai, Oahu, and Maui islands as part of the USGS National Assessment of Shoreline Change Project Trends in long-term (early 1900s – present) and short term (mid-1940s – present) shoreline change were calculated at regular intervals (20 m) along the shore using weighted linear regression.

A summary table of shoreline change trends for Kauai, Oahu, and Maui is provided below.

Shoreline Change Trends for Kauai, Oahu, and Maui									
Region	**No. of Transects**	**Beach Loss (km)**	**Beach Loss (%)**	**Average Rate (m/y)**		**% Eroding**		**% Accreting**	
				LT	**ST**	**LT**	**ST**	**LT**	**ST**
Kauai									
North	1104	1.7	8	- 0.11 ± 0.02	- 0.06 ± 0.02	76	60	23	38
East	867	1.0	6	- 0.15 ± 0.02	- 0.06 ± 0.02	78	63	19	33
South	790	1.9	14	- 0.01 ± 0.02	0.05 ± 0.04	63	57	34	39
West	962	1.5	7	- 0.13 ± 0.04	0.16 ± 0.08	64	48	33	49
Total	3723	6.0	8	- 0.11 ± 0.01	0.02 ± 0.02	71	57	27	40
Oahu									
North	1287	0.2	1	- 0.11 ± 0.01	- 0.07 ± 0.01	73	68	25	30
East	2108	5.5	13	0.01 ± 0.01	- 0.01 ± 0.01	50	54	47	44
South	1319	3.0	11	- 0.04 ± 0.01	- 0.03 ± 0.02	50	47	48	50
West	628	0.0	0	- 0.25 ± 0.01	- 0.13 ± 0.02	83	71	16	27
Total	5342	8.7	8	- 0.06 ± 0.01	- 0.15 ± 0.01	60	58	38	40
Maui									
North	903	0.9	6	- 0.26 ± 0.02	- 0.22 ± 0.03	87	74	12	16
Kihei	1011	2.1	11	- 0.13 ± 0.01	- 0.12 ± 0.02	83	77	16	20
West	1519	3.8	14	- 0.15 ± 0.01	- 0.13 ± 0.01	85	77	14	18
Total	3433	6.8	11	- 0.17 ± 0.01	- 0.15 ± 0.01	85	76	14	18
Hawaii (all beaches studied)									
Total	12498	21.5	9	- 0.11 ± 0.01	- 0.06 ± 0.01	70	63	28	34

Erosion was the dominant trend of shoreline change on the islands, with 70% of the beaches indicating an erosional trend and an overall average shoreline change rate of – 0.11 ± 0.01 m/y during the long term. Only 28% of beaches indicated an accretional trend during the long term. Shoreline change had high spatial variability throughout the state, with cells of erosion and accretion typically separated by hundreds of meters on continuous beaches or by shore headlands that divide the coast into many small embayments. More than 21 km or 9% of the total length of the beaches studied was completely lost to erosion within the period of analysis. In nearly all cases, the beaches lost were replaced by seawalls or other coastal armoring. Short-term analysis also indicated an overall erosional trend, although the rate and extent of beach erosion appears to have slowed somewhat, with an overall average rate of – 0.06 ± 0.01 m/y and 63% of beaches that were erosional. Thirty-four percent of the beaches were accretional in the short term.

State of Hawaii Multi-Hazard Mitigation Plan 2013 Update
Available at: http://www.scd.hawaii.gov/documents/2013HawaiiStateMitigationPlan.pdf

The *State of Hawaii Multi-Hazard Mitigation Plan 2013 Update* quantifies the relative risk of natural hazards in order to prioritize hazard mitigation measures. Average Annualized Loss (AAL) estimates for each of the significant natural hazards to the State of Hawaii are listed in the table below.

State of Hawaii Estimated Average Annual Loss (AAL)	
Hazard	**AAL**
Tropical Cyclone	$390 Million / Year
Tsunami	$168 Million / Year
Earthquake	$106 Million / Year
Lava Flow	$24 Million / Year
Flood	$16 Million / Year
Coastal Erosion	$10 to $11 Million / Year
Debris Flow and Rockfall	$3 to $7 Million / Year

Subsequent ranking of risks based on average annual loss for each of the counties is provided in the table below.

Ranking of Risks based on Average Annualized Loss (AAL)			
Kauai	**Honolulu**	**Maui**	**Hawaii**
Tropical Cyclone	Tropical Cyclone	Tropical Cyclone	Tropical Cyclone
Tsunami	Tsunami	Tsunami	Earthquake
Coastal Erosion	Earthquake	Earthquake	Tsunami
Flood	Flood	Coastal Erosion	Lava Flow
Landslide and Rockfall	Landslide and Rockfall	Flood	Flood

Great Aleutian Tsunami Research
Available at: http://www.higp.hawaii.edu/reports/2014/

A systematic analysis of giant earthquake sources ($M_w \geq 9.25$) along the Aleutian-Alaska arc was conducted for Hawaii State Civil Defense (HSCD) in order to verify the adequacy of current tsunami evacuation maps. This analysis modeled earthquakes with the extremes of fault area, mean fault slip, and slip nearest the trench that characterized the largest megathrust earthquakes of the last century: 2004 M_w 9.3 Sumatra-Andaman, 1960 M_w 9.5 Chile, and 2011 M_w 9.1 Tohoku, respectively. The analysis concluded that a great M_w 9+ Aleutian earthquake could generate a tsunami in Hawaii larger than historically observed, exceeding current tsunami inundation maps. In response to these and subsequent findings (i.e., a giant $M_w \sim 9.25$ earthquake centered in the eastern Aleutians occurred ~350 to ~575 years ago, generating a tsunami event exceeding all historical tsunamis in the Hawaiian Islands in the last 200 years (Butler et al., 2014)),the City & County of Honolulu, in conjunction with state, federal, and non-government stakeholders, has developed a new set of Extreme Tsunami Evacuation Zone maps, refuge areas, and evacuation routes to complement the current tsunami evacuation maps for the island of Oahu. Draft Extreme Tsunami Evacuation Maps are available at: http://www.honolulu.gov/dem/default.html.

Risk and Vulnerability Assessment of Sea Level Risk Impact in Honolulu, Hawaii
Project maps available at: http://oos.soest.hawaii.edu/pacioos/projects/slr/

A mapping and modelling effort was conducted to assess the risk and vulnerability of the urban corridor of Honolulu, Hawaii (i.e., Diamond Head to Pearl Harbor) to coastal inundation hazards such as hurricanes and tsunamis under higher sea level projections. This project demonstrates that SLR will significantly increase the impacts of coastal hazards in Honolulu's urban corridor, the most populated and economically active area in the state of Hawaii. The analysis indicates that 80% of the study area's economy, nearly half of the population, and much of the infrastructure and land are at risk of inundation.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if significant state or territory-level changes (positive or negative) have occurred that could impact the CMP's ability to prevent or significantly reduce coastal hazards risk since the last assessment?

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these that address:			
elimination of development/redevelopment in high-hazard areas[16]	Y	Y	N
management of development/redevelopment in other hazard areas	Y	Y	N
climate change impacts, including sea level rise or Great Lake level change	Y	N	Y
Hazards planning programs or initiatives that address:			
hazard mitigation	Y	N	N
climate change impacts, including sea level rise or Great Lake level change	Y	N	Y
Hazards mapping or modeling programs or initiatives for:			
sea level rise or Great Lake level change	Y	N	Y
other hazards	Y	N	N

2. Briefly state how "high-hazard areas" are defined in your coastal zone.

The State of Hawaii employs the Federal Emergency Management Agency (FEMA), National Flood Insurance Program (NFIP), definition of coastal high hazard area:

An area of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms or seismic sources. The coastal high hazard area is identified as Zone V on Flood Insurance Rate Maps (FIRMs). Special floodplain management requirements apply in V Zones including the requirement that all buildings be elevated on piles or columns (See: https://www.fema.gov/national-flood-insurance-program-2/coastal-high-hazard-area).

[16] Use state's definition of high-hazard areas.

3. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the change;
    b. Specify if it was a 309 or other CZM-driven change; and
    c. Characterize the outcomes and/or likely future outcomes of the change(s).

Act 286, Session Laws of Hawaii 2012

a. Act 286, Session Laws of Hawaii 2012, amends the Hawaii State Planning Act, HRS Chapter 226, by adding climate change adaptation priority guidelines to Part III.

   Specifically HRS Chapter 226, is amended to read as follows:

   "§ 226-109 Climate change adaptation priority guidelines.

   Priority guidelines to prepare the State to address the impacts of climate change, including impacts to the areas of agriculture; conservation lands; coastal and nearshore marine areas; natural and cultural resources; education; energy; higher education; health; historic preservation; water resources; the built environment, such as housing, recreation, transportation; and the economy shall:

   i. Ensure that Hawaii's people are educated, informed, and aware of the impacts of climate change may have on their communities;

   ii. Encourage community stewardship groups and local stakeholders to participate in planning and implementation of climate change policies;

   iii. Invest in continued monitoring and research of Hawaii's climate and the impacts of climate change on the State;

   iv. Consider native Hawaiian traditional knowledge and practices in planning for the impacts of climate change;

   v. Encourage the preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, forests, streams, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change;

   vi. Explore adaptation strategies that moderate harm or exploit beneficial opportunities in response to actual or expected climate change impacts to the natural and built environments;

   vii. Promote sector resilience in areas such as water, roads, airports, and public health, by encouraging the identification of climate change threats, assessment of potential consequences, and evaluation of adaptation options;

   viii. Foster cross-jurisdictional collaboration between county, state, and federal agencies and partnerships between government and private entities and other non-governmental entities, including nonprofit entities;

ix. Use management and implementation approaches that encourage the continual collection, evaluation, and integration of new information and strategies into new and existing practices, policies, and plans; and

x. Encourage planning and management of the natural and built environments that effective integrate climate change policy."

b. The HCZMP was instrumental in developing the climate change adaptation priority guidelines. On August 22-23, 2011, the State of Hawai'i Coastal Zone Management Program, the National Oceanic and Atmospheric Administration, and U.S. Army Corps of Engineer's Honolulu District's (USACE) Silver Jackets initiative sponsored a workshop to facilitate the development of the foundation for a statewide climate change policy. Sixty participants engaged in the unique workshop, which combined a futures approach with appreciative inquiry to think "outside the box" and develop a common vision for moving forward. The results of the workshop, along with input from the broader community, laid the foundation for Act 286, Climate Change Adaptation Priority Guidelines, which was signed into law by Governor Neil Abercrombie on July 9, 2012.

c. Priority guidelines focus state and county resources on major areas of statewide concern that merit priority attention to improve the quality of life for Hawaii's present and future population through the pursuit of desirable course of action. The climate change adaptation priority guidelines are intended to serve as a guiding policy for adapting to the expected impacts of climate change through existing implementation provisions of the Hawaii State Planning Act, which include guiding all major state and county activities, programs, budgetary, land use, and other decision making processes, and county general plans and development plans, pursuant to Part II of the Hawaii State Planning Act.

Hawaii Ocean Resources Management Plan 2013 Update

a. The 2013 update to the Hawaii Ocean Resources Management Plan includes two management priorities directly related to climate change adaptation: (1) Management Priority #1 – Appropriate Coastal Development; and (2) Management Priority #2 – Management of Coastal Hazards.

b. The 2013 update to the Hawaii Ocean Resources Management Plan was a 309 driven effort included in the Hawaii CZM Program's approved 2011 – 2015 Assessment and Strategy.

c. In November 2013, the Council on Ocean Resources established an action team tasked with implementing ORMP Management Priorities #1 and #2. The Action Team (ACT) for Appropriate Coastal Development & Management of Coastal Hazards is comprised of representatives from several state and county agencies, as well as federal and academic partners. The ACT has met regularly since its inaugural meeting in April 2013 and is in the process of developing an action plan for implementation.

Act 83, Session Laws of Hawaii 2014

a. The Hawaii Climate Adaptation Initiative Act (Act 83, Session Laws of Hawaii 2014), addresses climate change adaptation by (1) establishing an interagency climate adaptation committee (ICAC), attached administratively to the Department of Land and Natural Resources, to develop a sea level rise vulnerability and adaptation report for

Hawaii through the year 2050; (2) authorizing the Office of Planning (OP) to coordinate the development of a statewide climate adaptation plan and to use the sea level rise vulnerability and adaptation report as a framework for addressing other climate threats and climate adaptation priorities identified in Act 286, Session Laws of Hawaii 2012; and (3) allocating funds and creating positions to carry out these purposes.

b. While Act 83, Session Laws of Hawaii 2014, was not a 309 or CZM-driven effort, the HCZMP assisted in the development of the draft legislation and monitored and testified in support of this initiative as it passed through the legislature.

c. The ICAC, with support from the DLNR, is tasked with developing a Sea Level Rise Vulnerability and Adaptation Report that shall be completed by no later than December 31, 2017 and include the following: (1) identification of the major areas of sea level rise impacts affecting the State and counties through 2050; (2) identification of expected impacts of sea level rise based on the latest scientific research for each area through 2050; (3) identification of the economic ramifications of sea level rise; (4) identification of applicable federal laws, policies, or programs that impact affected areas; and (5) recommendations for planning, management, and adaptation for hazards associated with increasing sea level rise.

   Additionally, the Office of Planning is tasked with conducting climate adaptation planning as follows: (1) develop, monitor, and evaluate strategic climate adaptation plans and actionable policy recommendations for the State and counties addressing expected statewide climate change impacts through the year 2050; (2) provide planning and policy guidance and assistance to state and county agencies regarding climate change; and (3) publish findings, recommendations, and progress reports on actions taken no later than December 31, 2017, and in its annual report to the Governor and the legislature thereafter.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	__X___
Medium	_____
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

   Of the nine enhancement areas, coastal hazards has been identified as the highest priority for both the HCZMP and surveyed stakeholders. The State of Hawaii is highly vulnerable to all types of coastal hazards, including tropical cyclones, tsunamis, earthquakes, flooding, erosion, etc., and future risk to coastal life and property is only expected to increase with climate change and sea level rise. It is therefore both timely and prudent for the HCZMP to conduct a Phase II Assessment to further explore specific problems, opportunities for improvement, and priority needs to inform the development of a Section 309 Strategy for this enhancement area.

Public Access

Section 309 Enhancement Objective: Attain increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value. §309(a)(3)

Phase I (High-level) Assessment: *(Must be completed by all states.)*

Purpose: To quickly determine whether or not public access is a priority enhancement objective for the state CMP that warrants a more in-depth assessment to understand key problems and opportunities that exist for program enhancement and the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Use the table below to provide data on public access availability within the coastal zone.

Public Access Status and Trends			
Type of Access	**Current number[17]**	**Changes or Trends Since Last Assessment[18]** (↑, ↓, –, unkwn)	**Cite data source**
Beach access sites	Unknown	Unknown	A comprehensive statewide beach/shoreline access database does not exist for Hawaii.
Shoreline (other than beach) access sites	Unknown	Unknown	A comprehensive statewide beach/shoreline access database does not exist for Hawaii.
Recreational boat (power or nonmotorized) access sites	[1] ± 31 small boat harbors, 26 launch ramps, 2 pier-only facilities, 7 anchorages, and 1 deep draft harbor* *Note: Figures above include State-operated commercial facilities and other boating related facilities.	Unknown	[1] State Department of Defense. (2013). *State of Hawaii Multi-Hazard Mitigation Plan 2013 Update.*
Number of designated scenic vistas or overlook points	More than: [1] 27 parks with scenic lookouts	Unknown	[1] State Department of Land and Natural Resources (DLNR). (2009). *State Comprehensive Recreation Plan (SCORP) 2008 Update.*

[17] Be as specific as possible. For example, if you have data on many access sites but know it is not an exhaustive list, note "more than" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.

[18] If you know specific numbers, please provide. However, if specific numbers are unknown but you know that the general trend was increasing or decreasing or relatively stable or unchanged since the last assessment, note that with a ↑ (increased), ↓ (decreased), – (unchanged). If the trend is completely unknown, simply put "unkwn."

Number of fishing access points (i.e. piers, jetties)	[1] 2 State Recreational Piers; [2] See Recreational boat (power or nonmotorized) access sites above.	Unknown	[1] DLNR-Division of State Parks (DOSP). *Hawaii State Parks - Parks*. Retrieved from http://www.hawaiistateparks.org/parks/ on 11/26/14.
Coastal trails/ boardwalks	<u>No. of Trails/ boardwalks</u> More than: [1] 99 Na Ala Hele Trails & Access Roads* *Does not include Kahuku Motocross Riding Area and Race Track on Oahu; 3 closed trails on Lanai Island; and Kula Trail System, Mokuleia Stair Access, Kahakapao Loop Trail, Maui Motocross Track, and 11 closed trails on Maui Island. [2] 13 Other State Park Hiking Trails. <u>Miles of Trails/boardwalks</u> More than: [1] 445.5 miles of Na Ala Hele Trails and Access Roads; and **[2]** 29.7 miles of Other State Park Hiking Trails.	[1] ↓ 14 trails; ↓ 18.5 miles [2] Unknown - number and miles of Other State Park Hiking Trails not reported in last assessment.	[1] Na Ala Hele Trail & Access System. Retrieved from http://www.hawaiitrails.org/home.php on 11/26/14. [2] DLNR-DOSP. *Hawaii State Parks - Hiking*. Retrieved from http://www.hawaiistateparks.org/hiking/ on 11/26/14.
Number of acres parkland/open space	<u>Total sites</u> More than: **[1]** National Wildlife Refuges (10 sites; 300,237.67 acres); **[2]** National Parks (7 sites; 369,202 acres); **[3]** State Parks and Historic Sites (69 sites; 33,522 acres); **[4]** State Forest Reserve Lands (N/A sites; 644,720 acres); **[5]** State Natural Area Reserves (20 sites; 123,432 acres); **[6]** State Public Hunting Areas (59 sites; 937,434 acres); **[7]** State Wildlife Sanctuaries and Refuges (57 sites; 52,900 acres); **[8]** County Parks (625 sites; 9,162 acres).	[1] ↑ 751.13 acres [2] ↑ 91 acres [3] – No change [4] ↓ 31,280 acres [5] ↑ 1 area; ↑ 14,268 acres [6] ↓ 2 areas; ↓ 259,166 acres [7] ↑ 2 areas; ↓ 41,900 acres	[1] U.S. Fish & Wildlife Service. (2014, May). *Annual Report of Lands under Control of the U.S. Fish & Wildlife Service as of September 30, 2013*. Retrieved from: http://www.fws.gov/refuges/land/LandReport.html. [2] Department of Business, Economic Development & Tourism (DBEDT). (2014). *2013 State of Hawaii Data Book*. Retrieved from: http://dbedt.hawaii.gov/economic/databook/.

	Sites per miles of shoreline More than: 847 sites per 1,052 Statute miles of tidal shoreline.	[8] ↑ 15 parks; ↑ 609 acres * Reported changes/trends since 2009 are based on the *Annual Report of Lands under Control of the U.S. Fish & Wildlife Service as of September 30, 2009* [1] and the *2009 State of Hawaii Data Book* [2]-[8].	[3] Ibid. [4] Ibid. [5] Ibid. [6] Ibid. [7] Ibid. [8] DBEDT. (2013). *2012 State of Hawaii Data Book.* Retrieved from: http://dbedt.hawaii.gov/economic/databook/.
Other (please specify)	N/A	N/A	N/A

2. Briefly characterize the demand for coastal public access and the process for periodically assessing demand. Include a statement on the projected population increase for your coastal counties[19]. There are several additional sources of statewide information that may help inform this response, such as the Statewide Comprehensive Outdoor Recreation Plan,[20] the National Survey on Fishing, Hunting, and Wildlife Associated Recreation,[21] and your state's tourism office.

   Demand for coastal public access remains high in Hawaii and will likely increase as the State's resident and visitor populations continue to grow. According to NOAA's National Coastal Population Report: Population Trends from 1970-2020, the population within Hawaii's coastal shoreline counties is projected to increase by 16 percent between 2010 and 2020 (NOAA, 2013; Available at: http://stateofthecoast.noaa.gov/).

   Similarly, the Hawaii Tourism Authority (HTA) reported in its 2013 Annual Visitor Research Report that total arrivals rose 1.8 percent to a new record of 8,174,460 visitors in 2013 (HTA, 2013; Available at: http://www.hawaiitourismauthority.org/). According to the State Department of Business, Economic Development & Tourism (DBEDT)'s tourism forecast for the 4th Quarter 2014, visitor arrivals are on-track to set another record in 2014 with tourism forecasts projecting a total arrival growth of .8 percent for 2014 (DBEDT, 2014; Available at: http://dbedt.hawaii.gov/).

   Additionally, several relevant federal and state agency studies conducted since the last assessment reveal high demand for outdoor recreation and need for additional recreational facilities. A review of these reports is provided below.

[19] See NOAA's Coastal Population Report: 1970-2020 (Table 5, pg. 9) http://stateofthecoast.noaa.gov/coastal-population-report.pdf
[20] Most states routinely develop "Statewide Comprehensive Outdoor Recreation Plans", or SCROPs, that include an assessment of demand for public recreational opportunities. Although not focused on coastal public access, SCORPs could be useful to get some sense of public outdoor recreation preferences and demand. Download state SCROPs at: http://www.recpro.org/scorps.
[21] The National Survey on Fishing, Hunting, and Wildlife Associated Recreation produces state-specific reports on fishing, hunting, and wildlife associated recreational use for each state. While not focused on coastal areas, the reports do include information on saltwater and Great Lakes fishing, and some coastal wildlife viewing that may be informative and compares 2011 data to 2006 and 2001 information to understand how usage has changed. See http://www.census.gov/prod/www/fishing.html.

2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation
(USFWS, Revised 2014; Available at: https://www.census.gov/prod/2013pubs/fhw11-hi.pdf).

The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation is conducted every five years (approximately) and is considered one of the most important sources of information on fish and wildlife recreation in the United States.

The 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation found that 465,000 Hawaii residents and nonresidents 16 years old and older fished, hunted, or wildlife watched in Hawaii. Of the total number of participants, 157,000 fished; 23,000 hunted; and 358,000 participated in wildlife-watching activities, including observing, feeding, and photographing wildlife. In 2011, state residents and nonresidents spent $993 million on wildlife recreation in Hawaii. Of that total, trip-related expenditures accounted for $752 million, while equipment expenditures totaled $212 million. The remaining $28 million was spent on licenses, contributions, land ownership and leasing, and other items.

2014 State Comprehensive Outdoor Recreation Plan Update: Report on the Public Participation Process & Findings on Public Demand (DRAFT)
(DLNR, 2014; Received via Personal Communication).

In order to be eligible for National Park Service (NPS) Land & Water Conservation Fund grants, every State must prepare and regularly update (i.e., every 5 years) a statewide comprehensive outdoor recreation plan (SCORP). Most SCORPs address the demand for and supply of recreation resources within a state, identify needs and new opportunities for recreation improvements, and set forth and implementation program to meet the goals identified by its citizens and elected leaders. The State Department of Land and Natural Resources is delegated the responsibility for preparing and implementing the SCORP and is in the process of finalizing the 2014 Update.

The Report on the Public Participation Process & Findings on Public Demand is intended to describe preferences for outdoor recreation in Hawaii, while documenting public participation in the developing the 2014 SCORP Update. A summary of draft findings from the online public survey, public meetings, and meetings with agency staff is provided below.

i. 1,122 members of the public, which comprises 0.08% of the Hawaii's population, participated in the online survey. 96% of survey respondents live in Hawaii as their primary place of residence.

ii. Visiting a beach is the most popular and most frequently participated in water-based activity. Hiking is the most popular land-based activity, but walking on paths, tracks, or sidewalks is the most frequently participated in land-based activity.

iii. When asked about the quality, quantity, accessibility, and condition of land and water-based facilities, respondents gave the worst scores to the condition of the facilities.

iv. Nearly half (44.6%) of the respondents reported that they are limited or prevented from participating in an outdoor activity due to conflict with another activity that shares facilities or resources with their activity. The most common issues mentioned as being involved in conflict were boating, too many users, and swimming.

v. Respondents support a variety of fees for funding the development and maintenance of recreational areas and/or facilities, but commercial user fees were supported the most by 18.8% of respondents.

vi. Respondents reported that addressing maintenance, improving or providing bathrooms, and improving or adding facilities are the most important actions that recreation managers can take to encourage people to participate in or improve their experience of outdoor recreation activities.

vii. Operating and maintaining existing infrastructure and facilities is both the public and recreation providers' number one priority for investment in outdoor recreation for the next five years. In addition, recreation providers reported that, over the next five years, they are mainly planning maintenance and repair projects (as opposed to land acquisition, new construction, facilities upgrades, and new or expanded programs).

viii. Recreation providers identified limited and/or decreasing funding/budgets as their most serious challenge in managing or providing recreation facilities.

ix. Nationwide trends that providers are seeing in Hawaii include the growth of stand-up paddle boarding and increasing participation in outdoor recreation due to increasing population.

3. If available, briefly list and summarize the results of any additional data or reports on the status or trends for coastal public access since the last assessment.

   No additional data or reports are available at this time.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state or territory-level management changes (positive or negative) that could impact the future provision of public access to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.

Management Category	**Employed by State or Territory** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y	Y
Operation/maintenance of existing facilities	Y	N	N
Acquisition/enhancement programs	Y	N	N

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
   a. Describe the significance of the change;
   b. Specify if it was a 309 or other CZM-driven change; and

c. Characterize the outcomes and/or likely future outcomes of the changes(s).

The following state-level management changes have taken effect since the last assessment:

Act 160, Session Laws of Hawaii 2010

a. Requires the Department of Land and Natural Resources to maintain beach transit corridors by prohibiting landowner's human-induced vegetation that interferes with access within the corridor and establishes access within the corridors as a policy of the Coastal Zone Management Program. Includes sunset clause providing that the Act shall be repealed on June 30, 2013.

b. Act 160, Session Laws of Hawaii 2010, was neither a 309, nor CZM-driven change.

c. For cases in which an abutting landowner's human-induced, enhanced, or unmaintained vegetation interferes with or encroaches upon beach transit corridors, DLNR is authorized to issue a Notice of Violation (NOV) to the abutting landowner, instructing them to remove the encroaching vegetation. Property owners who do not comply with the NOV are subject to fines of $1000.00 for a second conviction and $2000.00 for any subsequent convictions.

Act 120, Session Laws of Hawaii 2013

a. Ensures public lateral access along the shoreline by making permanent the requirement that landowners remove human-induced, enhanced, or unmaintained vegetation interfering with such access and maintaining the Department of Land and Natural Resources' enforcement duty to maintain such access (See Act 160 above).

b. Act 120, Session Laws of Hawaii 2013, was neither a 309, nor CZM-driven change.

c. Same as above.

3. Indicate if your state or territory has a publically available public access guide. How current is the publication and/or how frequently it is updated?[22]

Public Access Guide	Printed	Online	Mobile App
State or territory has? (Y or N)	N	N	N
Web address (if applicable)	N/A	N/A	N/A
Date of last update	N/A	N/A	N/A
Frequency of update	N/A	N/A	N/A

There is no publically available public access guide for the State of Hawaii; however, individual state and county agencies with responsibilities related to public access, as well as non-government organizations, have produced or are in the process of developing public access guides and/or websites.

[22] Note some states may have regional or local guides in addition to state public access guides. Unless you want to list all local guides as well, there is no need to list additional guides beyond the state access guide. However, you may choose to note that the local guides do exist and may provide additional information that expands upon the state guides.

The following represents a non-exhaustive list of the most current references:

Hawaii CZM Program

a. Interactive Shoreline Access Website – Under Construction (2011 – 2015 Sec. 309 A&S)

DLNR – Division of State Parks

a. Website: www.hawaiistateparks.org
b. Hawaii State Parks Visitor's Guide (2013) – Available at: http://www.hawaiistateparks.org/pdf/brochures/2013-Parks-Brochure.pdf

DLNR – Division of Forestry and Wildlife, Na Ala Hele Hawaii Trail and Access System

a. Website: https://hawaiitrails.ehawaii.gov/

County of Hawaii

a. Digital Shoreline Public Access Brochure (2006) – Available at: http://www.hawaiicounty.gov/pl-shoreline-access-big-island

University of Hawaii Sea Grant College Program

a. Coastal Access Website: http://seagrant.soest.hawaii.edu/coastal-access-hawaii

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	__X__
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

While both the Phase I Assessment and stakeholder survey responses suggest that Public Access is a high priority, the HCZMP contends that a large majority of the problems and needs identified will be addressed upon the successful completion of the FY 2011-2015 Section 309 Strategy for Public Access. In particular, the Hawaii CZM Program has been granted an extension for carrying out the proposed program change to adopt alternative financing mechanisms for the acquisition, improvement, and maintenance of shoreline public access and to develop an informational shoreline public access webpage to be published on the HCZMP website. Consequently, the HCZMP has decided to rank the Public Access enhancement area as a "Medium" priority and will not be conducting a Phase II Assessment or developing a strategy for Public Access at this time.

Marine Debris

Section 309 Enhancement Objective: Reducing marine debris entering the Nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris. §309(a)(4)

Phase I (High-level) Assessment: *(Must be completed by all states.)*

Purpose: To quickly determine whether or not marine debris is a priority enhancement objective for the CMP that warrants a more in-depth assessment to understand key problems and opportunities that exist for program enhancement as well as the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, characterize the existing status and trends of marine debris in the state's coastal zone based on the best available data.

Source of Marine Debris	Existing Status and Trends of Marine Debris in Coastal Zone		
	Significance of Source (H, M, L, unknwn)	**Type of Impact**[23] (aesthetic, resource damage, user conflicts, other)	**Change Since Last Assessment** (↑, ↓, –, unkwn)
Land-based			
Beach/shore litter	M	aesthetic, resource damage, other	–
Dumping	M	aesthetic, resource damage, other	–
Storm drains and runoff	M	aesthetic, resource damage, other	–
Fishing (e.g., fishing line, gear)	H	aesthetic, resource damage, user conflicts	–
Other (please specify) Plastics marine debris	H	aesthetic, resource damage	–
Ocean-based			
Fishing (e.g., derelict fishing gear)	H	resource damage, user conflicts, other	–
Derelict vessels	H	resource damage, other	↑
Vessel-based (e.g., cruise ship, cargo ship, general vessel)	M	aesthetic, resource damage	–
Hurricane/Storm	M	aesthetic, resource damage, other	–
Tsunami	M	aesthetic, resource damage, other	↑
Other (please specify)	N/A	N/A	

Note: NOAA Marine Debris Program, Pacific Islands Marine Debris Regional Coordinator (Personal Correspondence, 2014)

[23] You can select more than one, if applicable.

2. If available, briefly list and summarize the results of any additional state or territory-specific data or reports on the status and trends or potential impacts from marine debris in the coastal zone since the last assessment.

Hawaii Marine Debris Action Plan 2012-2013

The *Hawaii Marine Debris Action Plan* (HI-MDAP) 2012-2013 is the primary management plan for management of marine debris in the Hawaiian Islands. Since the last assessment the Hawaii Marine Debris Action Plan has been updated to include recent data, and to include plastic marine debris as an additional threat to ocean resources. According to the HI-MDAP, plastic marine debris has become an increasingly identified hazard.

Action plans for the HI-MDAP are updated every two years focusing on activities continue or establish new actions for the Hawaii Marine Debris community to accomplish. The 2014-2015 activity plan is expected to be complete by early 2015. The HCZMP continues to partner with multi-agency and non-profit groups to work towards developing policies and plans to support the effort.

Japanese Tsunami Marine Debris

Since the last assessment, marine debris sources increased in source areas of derelict vessels and tsunami largely due to the resulting debris from the 2011 Tōhoku Earthquake. It was estimated that 5 million tons of debris was swept into the ocean after the tsunami event. Although it is unclear how much Japan Tsunami Marine Debris (JTMD) is located in the Pacific Ocean, since September 2012 the State of Hawaii has recorded over 200 potential JTMD small boats and objects; 28 of which were potentially JTMD related vessels. Source identification can be difficult as only 16 of those items were positively identified as being from the tsunami event by the Japan Consulate.

In addition, the Japanese government dedicated $250,000 to Hawaii for removal of debris resulting from the 2011 Tōhoku earthquake and tsunami. This funding was allocated to and is managed by the Department of Land and Natural Resources and Department of Health.

Honolulu Strategy

In March 2011, the marine debris community was brought together for the Fifth International Marine Debris Conference. One of the major outcomes was the Honolulu Strategy. The Honolulu Strategy is a global framework for prevention and management of marine debris that was developed with scientists, practitioners, managers, and private sectors on a global scale. Rather than superseding any state or local management actions towards addressing marine debris, the Honolulu Strategy "provides a focal point for improved collaboration and coordination amount the multitude of stakeholders across the globe concerned with marine debris." It emphasizes the need for participation and support on multiple levels for successful implementation of the strategy. The 2012-2013 HI-MDAP goals and strategies align with the Honolulu Strategy in order to allow for a simpler planning and progress tracking process.

Management Characterization:

1. Indicate if the approach is employed by the state or territory if there have been any significant state or territory-level management changes (positive or negative) for how marine debris is managed in the coastal zone.

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Marine debris statutes, regulations, policies, or case law interpreting these	Y	N	Y
Marine debris removal programs	N	N	N

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the change;
    b. Specify if it was a 309 or other CZM-driven change; and
    c. Characterize the outcomes and/or likely future outcomes of the change(s).

Hawaii does not have a state-level marine debris removal program. Rather, agencies work to reduce the amount of marine debris based on their respective functional areas. CZM continues to review proposed projects and promote best management practices with the use of its *Hawaii Watershed Guidance* (http://health.hawaii.gov/cwb/files/2013/05/Hawaiis-Watershed-Guidance.pdf). Recent changes in statutes, regulations, and policies that affect marine debris are described below.

Abandoned and Derelict Vessels

a. Recent actions by the Department of Land and Natural Resources, Division of Boating and Ocean Recreation (DOBOR) have contributed to potential reduction of abandoned and derelict vessels.

   A new section, 13-244-15.5, Hawaii Administrative Rules (HAR), amends HAR Chapter 13-244 such that "any person operating a power driven vessel on the waters of the State shall be required to possess a certificate of completion from a National Association of State Boating Law Administrators (NASBLA) approved course on the safe use and operation of a power driven vessel that contains a component on Hawaii waters approved by the department. This mandatory boaters education course for Hawaii went into effect on November 10, 2014 and includes (1) local ocean safety principles and practices; and (2) any rules or laws pertaining to protected species and power driven vessel operation in the State.

   In addition, HRS § 200-41 was modified allowing the State of Hawaii to deem a vessel abandoned or derelict if left in state waters or public property without a 30-day wait period.
b. This was not a 309 or CZM-driven change.
c. These modifications allow for both preventative measures and actionable enforcement to reduce the amount of abandoned and derelict vessels.

Plastic Bag Bans

a. The State has been very active in working towards reducing plastic bag waste in all counties. The entire state has adopted plastic bag ordinances that reduce and/or ban the use of single-use checkout bags in their respective counties. The ordinances have already taken into effect in three out of four counties. Honolulu County's ordinance will be effective on July 1, 2015.

Plastic bags account for 4 of 5 bags distributed at grocery stores. By either reducing these numbers by charging a fee or eliminating plastic shopping bags altogether, these actions can greatly reduce the amount of waste that is discharged into the environment and landfills. In addition, with the reduction of use of plastics in the State, less plastic will contribute to the "great garbage patch" in the ocean that is floating between Hawaii and San Francisco.

Plastic Bag Reduction Ordinance – Kauai County

In October of 2009, the Kauai County Council adopted a new law that aimed to reduce the number of plastic checkout bags released into the environment. The Kauai County Plastic Bag Reduction Law requires businesses to provide only recyclable paper or reusable bags to their customers and defines the types of bags that are acceptable for distribution to customers. The ordinance encourages customers to provide their own reusable bags and does not preclude businesses from offering checkout bags for a fee to those customers that do not provide their own bags. The law went into effect on January 11, 2011 (County of Kauai Plastic Bag Reduction Ordinance No. 885).

Plastic Bag Reduction Ordinance – Maui County

In August of 2010, Ordinance No. 3587 was signed into law and incorporated into the Maui County Code under Title 20 Environmental Protection, Chapter 20.18 Plastic Bag Reduction. The ordinance are prohibits businesses from providing plastic bags to their customers at point of sale and places restrictions of other types of plastic bags that are not used for the purposes of transporting groceries or other goods. In addition, the ordinance encourages customers to provide their own reusable bags and/or alternatives to plastic such as paper bags. The law went into effect on January 11, 2011.

Plastic Bag Reduction Ordinance – Hawaii County

Plastic Bag Reduction Ordinance 12-1 became effective on January 13, 2013. During the first year of the law, the ordinance requires businesses to charge a fee should they choose to provide single use plastic carry out bags. Starting on January 17, 2014, all single use carry out bags were prohibited. The ordinance does not address the use of paper checkout bags.

Plastic Bag Ban – Honolulu County

Ordinance 12-8, amended by Ordinance 14-29, regulates the use of plastic bags on Oahu. Under this law, businesses will be prohibited from providing plastic checkout bags and non-recyclable paper bags to customers for the purposes or transporting groceries or other goods. This does not preclude businesses from making available, with or without a fee, reusable bags, compostable plastic bags, or recyclable paper bags. This law will go into effect on July 1, 2015 (City and County of Honolulu, Ordinance 12-8 and 14-29).

b. These were not 309 or CZM-driven changes.
c. The plastic bag reduction ordinances will likely reduce the amount of plastics released into the environment that contribute to marine debris, and cause injuries and deaths of numerous marine animals and birds.

Tobacco Ban

a. Counties in the State have also been active in the prohibition of tobacco use and tobacco products in certain public areas, including public parks. While the primary purpose of these initiatives has been to promote public health, a beneficial secondary outcome has resulted that

may potentially reduce the amount of marine debris on public shorelines. Hawaii County parks and beaches went smoke free in 2008. Other counties have followed including:

Honolulu County – Amendments to Revised Ordinances of Honolulu Chapter 41, Article 21
This ordinance amends Section 41-21.1 Revised Ordinances of Honolulu 1990 such that the definition of "public park" which means "any park, park roadway, playground, athletic field, beach, beach right-of-way, etc…" Thereby, all areas in public parks prohibit smoking as listed in Section 41-21.2(m). This law went into effect on January 1, 2014. Exceptions include Honolulu county golf courses.

Maui County – County Code 13.040.20
This code was amended so that it is unlawful to "engage in smoking or the use of tobacco products" in County Parks and Beaches. The law went into effect on April 22, 2014.

b. These were not 309 or CZM-driven changes.
c. Bans on tobacco smoking in beaches and other public park areas may decrease the amount of waste contributed to the ocean and shorelines. Narratively, beachgoers and those that frequent beaches for employment have noticed a reduction in the amount of cigarette butt litter.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	_____
Low	__X___

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

NOAA Marine Debris Program is the lead agency for the coordination of multi-agency partners to provide support for marine debris related projects, activities, and actions in the Pacific Island Region. The agency works with state, federal, and non-profits to coordinate activities within the State to reduce the amount of marine debris from both land-based and marine sources.

The HCZMP defers actions related to marine debris to those agencies with direct authority and resources to address this enhancement area and continues to partner through supporting roles and participation in HI-MDAP planning and strategic activities. Marine debris is also addressed as a part of the State's Ocean Resources Management Plan (ORMP).

Cumulative and Secondary Impacts

Section 309 Enhancement Objective: Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources.§309(a)(5)

Phase I (High-level) Assessment: *(Must be completed by all states.)*

Purpose: To quickly determine whether or not cumulative and secondary impacts is a priority enhancement objective for the CMP that warrants a more in-depth assessment to understand key problems and opportunities that exist for program enhancement as well as the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Using National Ocean Economics Program Data on population and housing,[24] please indicate the change in population and housing units in the state's coastal counties between 2012 and 2007. You may wish to add additional trend comparisons to look at longer time horizons as well (data available back to 1970) but, at a minimum, please show change over the most recent five year period (2012-2007) to approximate current assessment period.

Trends in Coastal Population and Housing Units				
Year	**Population**		**Housing**	
	Total (# of people)	% Change (compared to 2007)	Total (# of housing units)	% Change (compared to 2007)
2007	1,283,388	8.49%	506,717	3.47%
2012	1,392,313		524,343	

[24] http://www.oceaneconomics.org/. Enter "Population and Housing" section. From dropdown boxes, select your state, and "all counties". Select the year (2012) and the year to compare it to (2007). Then select "coastal zone counties". Finally, be sure to check the "include density" box under the "Other Options" section.

2. Using provided reports from NOAA's Land Cover Atlas[25] or high-resolution C-CAP data[26] (Pacific and Caribbean Islands only), please indicate the status and trends for various land uses in the state's coastal counties between 2006 and 2011. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different timeframe than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico and CNMI currently only have data for one time point so will not be able to report trend data. Instead, Puerto Rico and CNMI should just report current land use cover for developed areas and impervious surfaces.

Distribution of Land Cover Types in Coastal Counties*		
Land Cover Type	**Land Area Coverage in 2005 (Acres)**	**Gain/Loss Since 2001 (Acres)**
Developed, High Intensity	12,397,598	74,311
Developed, Low Intensity		111,394
Developed, Open Space	7,565,102	47,414
Grassland	26,256,220	356,461
Scrub/Shrub	59,828,089	946,050
Barren Land (Bare Land)	9,894,420	694,629
Open Water	18,152,349	279,595
Agriculture (Cultivated)	15,815,023	159,802
Forested (deciduous, evergreen & mixed)	79,325,823	1,271,123
Woody Wetland (forested wetlands)	10,007,823	91,731
Emergent Wetland	820,679	7,559

**Note: 2005 and 2001 are latest datasets available.*

[25] http://www.csc.noaa.gov/ccapatlas/.
[26] http://www.csc.noaa.gov/digitalcoast/data/ccaphighres

3. Using provided reports from NOAA's Land Cover Atlas[27] or high-resolution C-CAP data[28] (Pacific and Caribbean Islands only), please indicate the status and trends for developed areas in the state's coastal counties between 2006 and 2011 in the two tables below. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different timeframe than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico and CNMI currently only have data for one time point so will not be able to report trend data. Unless, Puerto Rico and CNMI have similar trend data to report on changes in land use type, they should just report current land use cover for developed areas and impervious surfaces.

Development Status and Trends for Coastal Counties**			
	2001	**2005**	**Percent Net Change**
Percent land area developed	2%	4%	2%
Percent impervious surface area	Same	Same	Same

** Note: Islands likely have data for another time period and may only have one time interval to report. If so, only report the change in development and impervious surface area for the time period high-resolution C-CAP data is available. PR and CNMI do not need to report trend data.*
***Note: 2005 and 2001 are latest datasets available.*

How Land Use is Changing in Coastal Counties**	
Land Cover Type	**Areas Lost to Development Between 2001-2005** (Acres)
Barren Land (Bare land)	1,503
Emergent Wetland	5.34
Woody Wetland	0.67
Open Water	0.89
Agriculture (Cultivated	129
Scrub/Shrub	608
Grassland	1,281
Forested (deciduous, evergreen & mixed	292

** Note: Islands likely have data for another time period and may only have one time interval to report. If so, only report the change in land use for the time period high-resolution C-CAP data is available. PR and CNMI do not report.*
***Note: 2005 and 2001 are latest datasets available.*

[27] http://www.csc.noaa.gov/ccapatlas/
[28] http://www.csc.noaa.gov/digitalcoast/data/ccaphighres

4. Using data from NOAA's State of the Coast "Shoreline Type" viewer,[29] indicate the percent of shoreline that falls into each shoreline type.[30] You may provide other information and/or use graphs or other visuals to help illustrate.

Shoreline Types	
Surveyed Shoreline Type	**Percent of Shoreline**
Armored	11%
Beaches	38%
Flats	1%
Rocky	40%
Vegetated	10%

5. If available, briefly list and summarize the results of any additional state or territory-specific data or reports on the cumulative and secondary impacts of coastal growth and development, such as water quality and habitat fragmentation, since the last assessment to augment the national datasets.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state-level changes (positive or negative) in the development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources, since the last assessment?

Management Category	**Employed by State or Territory** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y (SMA)	Y
Guidance Documents	y	N	N
Management Plans (including SAMPs)	Y	Y (SMA)	N

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the change;
    In 2011 and 2012, the County of Maui completed amendments to Chapter 15-111 Rules for Design of Storm Water Treatment Best Management Practices (Effective 11/24/12), Ordinance 3902 which amends Chapter 18.20 Maui County Code, Relating to Subdivision Improvements (2011) and Ordinance 3928 Repealing Chapter 16.26A and Establishing a new Chapter 16.26B, Maui County Code, Relating to the Building Code (2012). These amendments provide mitigation for peak runoff during storm and average runoff volume and are consistent with the CZARA 6217 Program.

[29] http://stateofthecoast.noaa.gov/shoreline/welcome.html

[30] Note: Data is from NOAA's Environmental Sensitivity Index (ESI) Maps. Data from each state was collected in different years and some data may be over ten years old now. However, it can still provide a useful reference point absent more recent statewide data. Feel free to use more recent state data, if available, in place of ESI map data. Use a footnote to convey data's age and source (if other than ESI maps).

In 2013, the HCZMP developed a guidance document to assess the impacts of proposed urban development on stormwater. The guidance provides assistance to decision makers and environmental document preparers to identify and describe potential predictable impacts of development proposals and in determining which mitigation measures should be required if the development is approved.

b. Specify if it was a 309 or other CZM-driven change; and
The amendment to the Maui stormwater ordinance was a 2011-2015, section 309 strategy.

Development of a guidance document and training was a 2006-2010, Section 309 strategy.

c. Characterize the outcomes and/or likely future outcomes of the changes(s).
The County of Maui amendments to ordinances and building code rules pertaining to BMPs will assist the county in reducing runoff.

The guidance document will be used by decision makers and environmental document preparers to identify and describe potential predictable impacts of land development on stormwater.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	__x___
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

While cumulative and secondary (CSI) impacts are important within the HCZMP, the enhancement area is identified mid-level priority for this strategy period. Results from the stakeholder survey also support this prioritization as it ranked in the middle of the nine enhancement areas.

Special Area Management Planning

Section 309 Enhancement Objective: Preparing and implementing special area management plans for important coastal areas. §309(a)(6)

The Coastal Zone Management Act defines a Special Area Management Plan (SAMP) as "a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone. In addition, SAMPs provide for increased specificity in protecting natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decision making."

Phase I (High-level) Assessment: *(Must be completed by all states and territories.)*

Purpose: To quickly determine whether or not special area management planning is a priority enhancement objective for the CMP that warrants a more in-depth assessment to understand key problems and opportunities that exist for program enhancement as well as the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, identify geographic areas in the coastal zone subject to use conflicts that may be able to be addressed through special area management plans (SAMPs). This can include areas that are already covered by a SAMP but where new issues or conflicts have emerged that are not addressed through the current SAMP.

   In Hawaii, Community Development Districts (CDD), Natural Area Reserves, Marine Life Conservation Districts (MLCD), Estuarine Reserves, and Wildlife Sanctuaries have been identified as Special Area Management.

Geographic Area	Opportunities for New or Updated Special Area Management Plans
	Major conflicts/issues
Heeia	New NERR Management Plan to be developed 2014-2016
Heeia CDD	New CDD designated by Hawaii State Legislature in 2011 by Act 210

2. If available, briefly list and summarize the results of any additional state or territory-specific data or reports on the status and trends of special area management plans since the last assessment.

   Community Development Districts (CDD)
   CDDs are lands designated by the Hawaii state legislature in support of alternative methods for managing and financing infrastructure required to support community development. The Hawaii Community Development Authority (HCDA) manages the CDDs. CDDs are designated by Hawaii Revised Statutes (HRS) Chapter 206E. There are three CDDs: Kakaako, Kalaeloa, and Heeia. The Heeia CDD was designated in 2011 and is new since the last Section 309 assessment.

Natural Area Reserves (NARS)

Hawaii possesses unique natural resources, such as geological and volcanological features and distinctive marine and terrestrial plants and animals, many of which occur nowhere else in the world, and are highly vulnerable to loss by the growth of population and technology. Therefore, the Hawaii state legislature established the statewide Natural Area Reserves System (NARS) to preserve in perpetuity specific land and water areas which support communities, as relatively unmodified as possible, of the natural flora and fauna, as well as geological sites, of Hawaii. (HRS Chapter 195) The Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife, manages the 20 reserves on five islands, encompassing 123,431 acres of the State's most unique ecosystems. Since the last 309 assessment, the Nakula Natural Area Reserve on Maui was added to the NARS in 2011.

http://dlnr.hawaii.gov/ecosystems/nars/

Marine Life Conservation Districts (MLCD)

Marine Life Conservation Districts (MLCD) are designed to conserve and replenish marine resources. One of Hawaii's natural treasures is the wide variety of marine fishes that occur in the nearshore waters. Over 400 species of inshore and reef fishes inhabit Hawaii's coastal waters, which feature a number of different habitats, each with its own characteristic marine life. MLCDs allow only limited fishing and other consumptive uses, or prohibit these uses entirely. They provide fish and other aquatic life with a protected area in which to grow and reproduce. MLCDs are established by the DLNR, as authorized by HRS Chapter 190. Currently, there are 11 MLCDs, located on four islands.

http://state.hi.us/dlnr/dar/mlcd.html

Wildlife Sanctuaries

The DLNR establishes wildlife sanctuaries, under the authority of HRS Chapter 183D and Chapter 195D, for the purpose of conservation, management, and protection of indigenous wildlife and their habitats. The DLNR Division of Forestry and Wildlife manages the State Wildlife Sanctuaries. On May 22 2014, the DLNR released its draft updated master plan for the Kawainui Marsh-Hamakua Complex on Oahu. A list of all the wildlife sanctuaries in Hawaii is contained in the administrative rules: http://files.hawaii.gov/dlnr/dofaw/rules/Chap126.pdf

Estuarine Reserves

In 2012 the Governor of Hawaii initiated the process of establishing an estuarine research reserve in the state. The National Estuarine Research Reserve System (NERRS) is a network of 28 reserves and once a site is designated, Hawaii will be the first to represent the Pacific biogeographic region in the network. Established by the Coastal Zone Management Act of 1972, the system is a partnership between the National Oceanic and Atmospheric Administration and coastal states. The Governor of Hawaii identified the Office of Planning's Coastal Zone Management Program as the lead for the site selection process in the state. The site selection process has three phases. The first phase included developing criteria for the site's selection, forming a site selection committee to look over and approve the criteria, and organizing a site evaluation committee to analyze and review the site proposals. In phase two of the site selection process, the site selection committee reviewed all submitted proposals and drafted the final plan that has been forwarded to the Governor, who will then nominate the site to NOAA. The HCZMP received inquiries from all four counties and two site proposals, and after careful deliberation, has selected Heeia on the windward side of the island of Oahu as the preferred site. The Heeia nomination document has been sent to NOAA for review. The HCZMP is preparing to enter phase three of the site selection process in the last quarter of 2014.

This phase involves delineating the boundary of the site, working with partners and stakeholders to develop a management plan, and working with NOAA to complete an Environmental Impact Assessment. Once these documents are completed, they will be reviewed and the site is expected to be formally designated as a NERR. http://planning.hawaii.gov/czm/initiatives/nerrs-site-proposal-process/

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state or territory-level management changes (positive or negative) that could help prepare and implement special area management plans in the coastal zone.

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
SAMP policies, or case law interpreting these	Y	N	N
SAMP plans	Y	N	N

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the change;
    b. Specify if it was a 309 or other CZM-driven change; and
    c. Characterize the outcomes and/or likely future outcomes of the changes(s).

Kakaako Community Development District

a. The HCDA undertook a community master planning project for the Kakaako CDD and developed master plans in 2011 for both the Makai and Mauka Areas. In addition, in 2013 a Transit Oriented Development (TOD) plan was developed to serve as a supplement to the existing development plans and rules established by the HCDA for Kakaako. The TOD plan is intended to enhance the quality of Kakaako, rather than to redefine the character of the neighborhoods. B.
b. These planning initiatives are driven by non-CZM efforts.

Heeia Community Development District

a. The Hawaii state legislature added a new CDD in 2011, the Heeia CDD.
b. This initiative is driven by non-CZM efforts.

Nakula Natural Area Reserve

a. In 2011, the Natural Area Reserves System added the Nakula Natural Area Reserve on Maui, which brings the number of reserves to 20, encompassing 123,431 acres of the State's most unique ecosystems.
b. This initiative is driven by non-CZM efforts.

National Estuarine Research Reserve System – Heeia

a. The Office of Planning is currently in the process of coordinating the nomination for a National Estuarine Research Reserve in the state.
b. This initiative is CZM-driven and will serve as living laboratory for those who study coastal ecosystems.
c. This reserve will be the first to represent the Pacific biogeographic region and will enable researchers to better understand the effects of climate change and improve coastal management issues within this area.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	__X__
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

   There are government planning and management efforts and activities that are currently ongoing to address the SAMP areas which include: Community Development Districts; Natural Area Reserves System; Marine Life Conservation Districts; Wildlife Sanctuaries; and Estuarine Reserves. Therefore, the level of priority is medium.

Ocean and Great Lakes Resources

Section 309 Enhancement Objective: Planning for the use of ocean [and Great Lakes] resources. §309(a)(7)

Phase I (High-level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether or not ocean and Great Lakes resources is a priority enhancement objective for the CMP that warrants a more in-depth assessment to understand key problems and opportunities that exist for program enhancement as well as the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. Understanding the ocean and Great Lakes economy can help improve management of the resources it depends on. Using the Economic: National Ocean Watch,[31] indicate the status of the ocean and Great Lakes economy as of 2010 as well as the change since 2005 in the tables below. Include graphs and figures, as appropriate, to help illustrate the information. Note ENOW data is not available for the territories. The territories can provide alternative data, if available, or a general narrative, to capture the value of their ocean economy.

Status of Ocean and Great Lakes Economy for Coastal Counties (2011)				
	Establishments (# of Establishments)	**Employment** (# of Jobs)	**Wages** (Millions of Dollars)	**GDP** (Millions of Dollars)
Living Resources	*139*	*778*	*24.4*	*62.0*
Marine Construction	*34*	*636*	*55.9*	*114.1*
Marine Transportation	*97*	*3,664*	*225.4*	*470.3*
Offshore Mineral Extraction	*10*	*126*	*10.9*	*6.3*
Tourism & Recreation	*3,653*	*92,419*	*2.6 billion*	*5.4 billion*
All Ocean Sectors	*3,962*	*102,925*	*3.3 billion*	*6.1 billion*

Change in Ocean and Great Lakes Economy for Coastal Counties (2005-2011)				
	Establishments (% change)	**Employment** (% change)	**Wages** (% change)	**GDP** (% change)
Living Resources	*-13.12*	*-9.95*	*0.46*	*14.15*
Marine Construction	*30.77*	*35.9*	*64.64*	*72.71*
Marine Transportation	*-11.01*	*-30.42*	*-5.82*	*2.31*
Offshore Mineral Extraction	*42.86*	*-4.55*	*-6.15*	*1593.24*
Tourism & Recreation	*6.35*	*-2.2*	*13.26*	*9.97*
All Ocean Sectors	*5.4*	*-2.81*	*14.05*	*10.82*

[31] http://www.csc.noaa.gov/enow/explorer/. If you select any coastal county for your state, you receive a table comparing county data to to state coastal county, regional, and national information. Use the state column for your responses.

2. In the table below, characterize how the threats to and use conflicts over ocean and Great Lakes resources in the state or territory's coastal zone have changed since the last assessment.

Significant Changes to Ocean and Great Lakes Resources and Uses	
Resource/Use	**Change in the Threat to the Resource or Use Conflict Since Last Assessment** (↑, ↓, –, unkwn)
Resource	
Benthic Habitat (including coral reefs)	↑
Living marine resources (fish, shellfish, marine mammals, birds, etc)	-
Sand/gravel	↑
Cultural/historic	-
Other (please specify)	
Use	
Transportation/navigation	-
Offshore development[32]	-
Energy Production	-
Fishing (Commercial and Recreational)	↑
Recreation/Tourism	↑
Sand/gravel extraction	Unknown
Dredge disposal	-
Aquaculture	-
Other (please specify)	

3. For the ocean and Great Lakes resources and uses in Table 2 (above) that had an increase in threat to the resource or increased use conflict in the state or territory's coastal zone since the last assessment, characterize the major contributors to that increase.

Major Contributors an Increase in Threat or Use Conflict to Ocean and Great Lakes Resources												
Resource	**Major Reasons Contributing to Increased Resource Threat or Use Conflict** (Note All that Apply with "X")											
	Land-based development	Offshore development	Polluted runoff	Invasive species	Fishing (Comm & Rec)	Aquaculture	Recreation	Marine Transportation	Dredging	Sand/Mineral Extraction	Ocean Acidification	Other (Specify)
Example: Living marine resources		*X*	*X*	*X*	*X*	*X*		*X*	*X*			
Benthic Habitat			X	X			X		X		X	
Sand/gravel	X						X			X		
Recreation/Tourism							X					

[32] Offshore development includes underwater cables and pipelines although any infrastructure specifically associated with the energy industry should be captured under the "energy production" category.

4. If available, briefly list and summarize the results of any additional state or territory-specific data or reports on the status and trends of ocean and Great Lakes resources and/or threats to those resources since the last assessment to augment the national datasets.

Benthic Habitat (including coral reefs)

The 2010 Hawaii Coral Reef Strategy (HCRS) is the guiding coral reef management document for the State with support from the NOAA Coral Reef Conservation Program. It was updated in 2010 and includes the goals and priority objectives for 2010-2020. The HRCS focuses its strategy on two priority sites in the State in West Maui and in South Kohala, Hawaii.

The State is also currently reacting to high coral bleaching occurrences for waters around Hawaii as a result from warmer sea surface temperatures. Although some bleaching is expected typically during the peak season from July-September, the DLNR Division of Aquatic Resources (DAR) Rapid Response Team has deployed efforts towards higher than expected coral bleaching events in 2014. Current management efforts include rapid assessment surveys in near shore waters of Oahu and Kauai to identify the magnitude, characterize the general health of the site, and record recovery from the event.

In addition to reported bleaching in the Papahanaumokuakea Marine National Monument, other coral bleaching reports have been received through the Eyes of the Reef Network, reporting incidents from islands of Oahu, Maui, Kauai, and Molokai in mostly shallow, near shore waters.

The DAR Rapid Response Team has conducted surveys in locations on Oahu and Kauai to continue to assess and monitor coral colonies in these areas for a general assessment of coral health and potential recovery.

Living marine resources (fish, shellfish, marine mammals, birds, etc)

Reef Fish

In areas with accessible shorelines, fish biomass saw a dramatic decline as population increased. This is particularly true for more heavily targeted fish species such as surgeonfish, red fish, goatfish, jacks, and other large predators, large parrotfish, and large wrasse.

Shellfish

In general, threats such as ocean acidification are progressive threat to live marine resources that have calcium carbonate shells that may be sensitive to small changes in acidity. This affects not only the living resources themselves, but also the indirect contributions as “cultural, economic, or biological importance as primary producers, reef builders, etc…”

In general, threats such as ocean acidification are progressive threat to live marine resources that have calcium carbonate shells that may be sensitive to small changes in acidity. This affects not only the living resources themselves, but also the indirect contributions as “cultural, economic, or biological importance as primary producers, reef builders, etc…”

Marine Mammals

The *U.S. Pacific Marine Mammal Stock Assessments, 2013*, (Carretta et al., August 2014) provides stock assessments of marine mammals in Hawaii Stock. A brief indication of Hawaii stock and relative status are listed below including:

- Hawaiian Monk Seal (below optimum sustainable population),
- Rough-toothed Dolphin, Risso's Dolphin, Common Bottlenose Dolphin, Pantropical Spotted Dolphin, Striped Dolphin, Fraser's Dolphin, Melon-headed Whale, Pygmy Killer Whale, Killer Whale, Short-Finned Pilot Whale, Blainville's Beaked Whale, Cuvier's Beaked Whale, Longman's Beaked Whale, Blue Whale, Bryde's Whale, and Minke Whale (not a strategic stock, status relative to optimum sustainable population is unknown),
- Spinner Dolphin (not a strategic stock, status relative to optimum sustainable population is unknown, increasing issues with potential effect of swim-with-dolphin programs and other tourism activities as well as issues from potential exposure to high levels of Naval sonar and detonations during training exercises),
- False Killer Whale (not a strategic stock, status relative to optimum sustainable population is unknown – although Main Hawaiian Insular stock appears to have declined during past two decades, listed as "endangered" under the Endangered Species Act),
- Pygmy Sperm Whale, Dwarf Sperm Whale (not a strategic stock, status relative to optimum sustainable population is unknown, anthropogenic noise in the oceans has been suggested to be a habitat concern),
- Sperm Whale (listed as "endangered" under the Endangered Species Act, status relative to optimum sustainable population is unknown, anthropogenic noise in the oceans has been suggested as a habitat concern),
- Fin Whale (not a strategic stock, status relative to optimum sustainable population is unknown, anthropogenic noise in the oceans has been suggested as a habitat concern particularly for baleen whales that may communicate using low-frequency sound), and
- Sei Whale (listed previously as estimated to have been reduced to 20% of pre-whaling abundance in the Pacific, listed as "endangered" under the Endangered Species Act).

Sand/gravel

Research completed in the *National assessment of shoreline change: Historical shoreline change in the Hawaiian Islands: U.S. Geological Survey Open-File Report 2011*, (Fletcher, et al. 2012, 55p) indicates that 70% of beaches in Hawaii are undergoing chronic erosion and 10% (roughly 13 miles) of beaches were completely lost to erosion over the past century. It is highly likely that rates of coastal erosion and beach loss will accelerate in coming decades with increasing rates of sea-level rise.

Energy Production

Alternative energy projects looking to utilize ocean and wave energy to provide renewable energy resources remain largely at the research and development stage in Hawaii. The following is a summary of the known projects occurring in the State. At the time of this assessment, the projects do not have a significant impact to ocean resources, however increased petroleum costs fuel the potential for growth in this field which may result in an increase of interest within the State.

Natural Energy Laboratory of Hawaii Authority (NELHA) OTEC Pilot
NELHA is under current discussions to expand the existing ocean thermal energy conversion (OTEC) project to a 1 MW facility. Projects utilizing OTEC technology currently remain in the research and development phase.

Wave Buoy Activity
Wave energy has been explored as a potential source of natural energy. A 40 kWe buoy was tested between 2003 and 2011 in the Kaneohe Marine Corps Base Hawaii on the windward coast of Oahu. This was in place during the previous funding cycle, however since then, the US Navy is expanding the site to include two additional test berths (Hawaii National Marine Renewable Energy Center).

Undersea Cable(s)
The Hawaii Public Utilities Commission has opened a two proceedings involving the inter-island energy transmission via an undersea cable. The first is to investigate whether or not an interisland cable transmission system between Maui and Oahu is in the best public interest of the State (Hawaii Public Utilities Commission Docket 2013-0169). The second reviews the progress of a proposed Lanai Wind Project that would connect to Oahu via an undetermined route (Hawaii Public Utilities Commission Docket 2013-0168).

Projects similar to these align with the State of Hawaii Energy Policy Directive of "Connecting the islands through integrated, modernized grids" (Hawaii State Energy Office, 2014; Received via Personal Communication).

Fishing (Commercial and recreational)
According to the latest DLNR DAR *Commercial Marine Landings Summary Trend Report* for the calendar year 2012, the number of pounds of fish landed has increased between 2008 and 2012. In 2008, the number of pounds landed was 32,096,522. In 2012 the number of pounds landed was 33,708,354 with fluctuations within the five-year period. This data is collected from commercial fish dealers.

Hawaii does not have a recreational fishing permit, therefore there is limited data regarding recreational fishing.

Recreation/Tourism
The 2014 *State Comprehensive Outdoor Recreation Plan* (SCORP) *Update: Draft Report on Public Participation Process* shows an increase in participation in outdoor recreation due to increasing population. SCORP survey results indicate that competing activities in a facility or resource have limited or affected users' ability to perform their activity. This includes use of ocean recreation resources

Please see Section 3. Public Access for more detailed information regarding this use conflict.

Dredge Disposal
Disposal of dredging materials is not considered a significant contributor to resource conflicts. The majority of dredging – to maintain proper dredge depths for harbor berthing areas is performed on a periodic basis. Maintenance dredging will be occurring starting in 2015 for commercial harbors in

the State. Existing rules and regulations, and strict compliance standards for dredge disposal sites reduce risk to ocean resources.

The Department of Transportation, Harbors Division noted that additional dredging for Pier 4 at Hilo Harbor occurred starting in 2011 and was completed in 2012. They are currently in the process of a feasibility study for navigational improvements for Kalaeloa Barbers Point Harbor after the completion of a master plan update. These improvements will be based upon projected space and needs for the area (Department of Transportation, Harbors Division, 2014; Received via Personal Communication).

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if any significant state or territory-level changes (positive or negative) in the management of ocean and Great Lakes resources have occurred since the last assessment?

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	N	Y
Regional Comprehensive Ocean/Great Lakes Management Plans	Y	N	Y
State Comprehensive Ocean/Great Lakes Management Plans	Y	N	Y

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the change;
    b. Specify if it was a 309 or other CZM-driven change; and
    c. Characterize the outcomes and/or likely future outcomes of the changes(s).

<u>Statutes, regulations, policies, or case law</u>

a. That state has implemented new and amended rules that assist agencies to better manage natural resources in ocean and coastal areas. These are not particularly significant, but do reflect a positive trend towards management of natural resources by the State.

Coral and Live Rock Rules

Amendments to Hawaii Administrative Rules, Chapter 13-95, Rules Regulating the Taking and Selling of Certain Marine Resources, effective May 1, 2014 strengthened the State's ability to enforce penalties to intentional or negligent large-scale damage to stony coral and live rock, for example, by vessel grounding, introduction of sediments, biological contaminants, and other pollutants.

New bag limits, size limits, and restrictions for uhu (parrotfish) and goatish on Maui
Hawaii Administrative Rules chapter 13-95.1 set new bag and size limits for parrotfish and goatfish on Maui. The rule set bag and minimum size limits on these two fish species in order to more effectively manage the species and increase its numbers in Maui's near shore coral reefs. These rules are effective November 1, 2014.

b. These were not CZM-driven changes.
c. Outcomes from these new and amended rules may protect coral and live rock colonies from further health decline and physical damage. Enforcing size limits and bag limits for certain species of nearshore fish may ensure that a sustainable population continues and to support healthy nearshore coral reef systems in the area.

Regional Comprehensive Ocean/Great Lakes Management Plans

a. The Pacific Regional Ocean Partnership (PROP) includes a partnership between the Governors of American Samoa, Guam, Commonwealth of the Northern Marianas Islands, and Hawaii. The Pacific Regional Ocean Partnership Action Plan (Updated) 2014-2016 was completed May 29, 2014 and focuses on collaboration and partnerships to achieve common regional goals in environment and natural resource management, education, health, ocean observing systems, weather and climate information, and disaster risk reduction.
b. This was not a CZM-driven change.
c. Outcomes from this change include greater regional collaboration for the management of ocean resources.

State Comprehensive Ocean/Great Lakes Management Plans

a. The Hawaii Ocean Resources Management Plan (ORMP) was updated in 2013 for the next 5-year planning period. This update provides a framework for continued coordinated efforts with the state, county, federal agencies, and non-profit organizations to manage coastal and marine resources. The update focused on streamlining the previous Plan. The Plan identifies 11 management priorities, subsequent goals and objectives and metrics, and lists the responsible agency(s) responsible for the execution of the actions. State and County partners signed their commitment to the coordination and cooperation towards implementation of the Plan. This updated plan was formally endorsed by the Governor in July 2013.

   In November 2013, State and County agencies further demonstrated their commitment to ocean and coastal resources by adopting the Hawaii Ocean Partnership governance agreement.
b. This was a CZM-driven change.
c. Outcomes from this change included a commitment from State agencies to implement the plan with Governor and Department Director's endorsements.

3. Indicate if your state or territory has a comprehensive ocean/Great Lakes Management Plan.

Comprehensive Ocean/Great Lakes Management Plan	State Plan	Regional Plan
Completed plan (Y/N) (If yes, specify year completed)	Yes Hawaii Ocean Resources Management Plan (July, 2013)	Yes The Pacific Regional Ocean Partnership Action Plan 2014-2016 (May 29, 2014)
Under development (Y/N)	N	N
Web address (if available)	http://planning.hawaii.gov/czm/ocean-resources-management-plan-ormp/	http://www.pacificprop.org/prop/images/content/PROP%20ActionPlan-final-052814.pdf
Area covered by plan	Entire state of Hawaii	Hawaii, American Samoa, Guam, Commonwealth of the Northern Mariana Islands

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

   High __X___
   Medium _____
   Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

   Ocean resources remain a high priority in the HCZMP. The Hawaii Ocean Resources Management Plan (ORMP) serves as a framework for state, county, and federal agency coordination to implement management actions to ensure sustainable use of ocean and marine resources. A majority of issues covered in the Section 309 Program Enhancement Areas are included under the eleven (11) management priorities in the ORMP. Supporting this effort by developing a strategy for FY2016-2020 remains a high priority of the HCZMP to ensure the continuation of coordinated activities among key agencies within the State to address proper planning for natural resources and uses in coastal and marine areas of Hawaii.

Energy and Government Facility Siting

Section 309 Enhancement Objective: Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance. §309(a)(8)[33]

Phase I (High-level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether or not energy and Government facilities is a priority enhancement objective for the CMP that warrants a more in-depth assessment. The in-depth assessment would enable CMPs to understand key problems and opportunities that exist for program enhancement as well as the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, characterize the status and trends of different types of energy facilities and activities in the state or territory's coastal zone based on best available data. If available, identify the approximate number of facilities by type. The MarineCadastre.gov may be helpful in locating many types of energy facilities in the coastal zone.

Status and Trends in Energy Facilities and Activities in the Coastal Zone				
Type of Energy Facility/Activity	**Exists in CZ**		**Proposed in CZ**	
	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unkwn)	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unkwn)
Energy Transport				
Pipelines[34]	Y	-	N	-
Electrical grid (transmission cables)	Y	↑	Y	↑
Ports	Y	-	N	-
LNG[35]	N	-	Y	↑
Other (please specify)				
Energy Facilities				
Oil and gas	Y	-	N	-
Coal	Y	-	N	-
Nuclear[36]	N	-	N	-
Wind	Y	↑	Y	↑
Wave[37]	Y	-	Y	-
Tidal[49]	N	-	N	-

[33] CZMA § 309(a)(8) is derived from program approval requirements in CZMA § 306(d)(8), which states:
"The management program provides for adequate consideration of the national interest involved in planning for, and managing the coastal zone, including the siting of facilities such as energy facilities which are of greater than local significance. In the case of energy facilities, the Secretary shall find that the State has given consideration to any applicable national or interstate energy plan or program."
NOAA regulations at 15 C.F.R. § 923.52 further describe what states need to do regarding national interest and consideration of interests that are greater than local interests.
[34] For approved pipelines (1997-present): http://www.ferc.gov/industries/gas/indus-act/pipelines/approved-projects.asp
[35] For approved FERC jurisdictional LNG import/export terminals: http://www.ferc.gov/industries/gas/indus-act/lng/exist-term.asp
[36] The Nuclear Regulatory Commission provides a coarse national map of where nuclear power reactors are located as well as a list that reflects there general locations: http://www.nrc.gov/reactors/operating/map-power-reactors.html
[37] For FERC hydrokinetic projects: http://www.ferc.gov/industries/hydropower/gen-info/licensing/hydrokinetics.asp

Status and Trends in Energy Facilities and Activities in the Coastal Zone				
Type of Energy Facility/Activity	**Exists in CZ**		**Proposed in CZ**	
	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unkwn)	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unkwn)
Current (ocean, lake, river) [49]	N	-	N	-
Hydropower	Y	-	N	-
OTEC	N	-	Y	↑
Solar	Y	↑	Y	↑
Biomass	Y	↑	Y	↑
Other (please specify): Geothermal	Y	-	Y	↑

2. If available, briefly list and summarize the results of any additional state or territory-specific information, data, or reports on the status and trends for energy facilities and activities of greater than local significance in the coastal zone since the last assessment.

3. Briefly characterize the existing status and trends for Government facilities and activities of greater than local significance[38] in the state's coastal zone since the last assessment.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if significant state or territory-level changes (positive or negative) that could facilitate or impede energy and Government facility siting and activities have occurred since the last assessment.

Management Category	**Employed by State or Territory** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y	Y
State Comprehensive Siting Plans/Procedures	N	N	N

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the change;
    b. Specify if it was a 309 or other CZM-driven change; and
    c. Characterize the outcomes and/or likely future outcomes of the changes(s).

[38] The CMP should make its own assessment of what Government facilities may be considered "greater than local significance" in their coastal zone but could include military installations or significant federal government complex. An individual federal building may not rise to a level worthy of discussion here beyond a very cursory (if at all) mention).

Hawaii Clean Energy Initiative (HCEI)

a. In 2008, the State of Hawaii and the U.S. Department of Energy (DOE) entered into a Memorandum of Understanding (MOU) establishing the Hawaii Clean Energy Initiative (HCEI) to support the State's goal of reaching 70% of its energy needs through clean and renewable resources and energy efficiency measures by 2030. More recently in 2014, the State and the DOE signed a MOU, reaffirming their commitment to the HCEI.
b. The HCEI is not a 309 or CZM-driven effort.
c. In 2013, Hawaii reached an important milestone under the HCEI, generating 18% of its electricity from renewable resources. This achievement puts the State ahead of its interim 2015 target of 15%, and provides a jumpstart on reaching the 2020 goal of 25%. Combine with a 15.7% reduction in energy use through conservation and efficiency, the State is nearly halfway toward its 2030 goal of 70 percent clean energy. Furthermore, the successful execution of the 2014 MOU will position Hawaii as both a national and international test bed and provide replicable models for achieving similar results throughout the U.S. and other island energy systems across the globe.

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

High _____
Medium __X___
Low _____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

While the HCZMP recognizes the importance of renewable energy for the State, the Department of Business Economic Development and Tourism Energy Office remains as the State agency with the lead role in this enhancement area. The HCZMP remains committed to a supportive role for this enhancement area but defers leadership actions to the Energy Office.

Aquaculture

Section 309 Enhancement Objective: Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable states to formulate, administer, and implement strategic plans for marine aquaculture. §309(a)(9)

Phase I (High-level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether or not aquaculture is a priority enhancement objective for the CMP that warrants a more in-depth assessment to understand key problems and opportunities that exist for program enhancement and the effectiveness of existing management efforts to address those problems.

Resource Characterization:

1. In the table below, characterize the existing status and trends of aquaculture facilities in the state's coastal zone based on the best available data. Your state Sea Grant Program may have information to help with this assessment.[39]

Type of Facility/Activity	Status and Trends of Aquaculture Facilities and Activities		
	# of Facilities[40]	Approximate Economic Value	Change Since Last Assessment (↑, ↓, –, unkwn)
Food Fish	23	(D)	Decrease from 31 farms in 2005
Sport Fish	0	0	Same as 2005
Baitfish	0	0	Same as 2005
Ornamental Fish	14	(D)	Decrease from 17 farms in 2005
Crustaceans	12	$15,876	Decrease from 15 farms in 2005
Mollusks	3	(D)	Decrease from 6 farms in 2005
Misc	6	$29,123	Increase from 3 farms in 2005

(D) – Withheld to avoid disclosing data for individual farms

2. If available, briefly list and summarize the results of any additional state or territory-specific data or reports on the status and trends or potential impacts from aquaculture activities in the coastal zone since the last assessment.

Management Characterization:

1. Indicate if the approach is employed by the state or territory and if there have been any state or territory-level changes (positive or negative) that could facilitate or impede the siting of public or private aquaculture facilities in the coastal zone. None.

[39] While focused on statewide aquaculture data rather than just within the coastal zone, the *Census of Aquaculture* (http://www.agcensus.usda.gov/Publications/2002/Aquaculture/) may help developing your aquaculture assessment. The 2002 report, updated in 2005, provides a variety of state-specific aquaculture data for 2005 and 1998 to understand current status and recent trends. The next census is scheduled to come out late 2014 and will provide 2013 data.
[40] Be as specific as possible. For example, if you have specific information of the number of each type of facility or activity, note that. If you only have approximate figures, note "more than" or "approximately" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Aquaculture comprehensive siting plans or procedures	Y	N	N
Other aquaculture statutes, regulations, policies, or case law interpreting these	Y	N	N

2. For any management categories with significant changes briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the change;
    b. Specify if it was a 309 or other CZM-driven change; and
    c. Characterize the outcomes and/or likely future outcomes of the changes(s).

Enhancement Area Prioritization:

1. What level of priority is the enhancement area for the coastal management program?

    High _____
    Medium _____
    Low __X__

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

    This enhancement area is a low priority for the coastal management program because the Hawaii Department of Agriculture (HDOA), Aquaculture and Livestock Support Services Branch is the State's lead agency to advance commercial aquaculture. The State's aquaculture industry remains largely unchanged since the previous assessment, however the HCZMP does continue to explore opportunities to partner and support this Branch and the development of the aquaculture industry through the ORMP.

ASSESSMENT: PHASE II

Coastal Hazards

In-Depth Resource Characterization:
Purpose: To determine key problems and opportunities to improve the CMP's ability to prevent or significantly reduce coastal hazard risks by eliminating development and redevelopment in high-hazard areas and managing the effects of potential sea level rise and Great Lakes level change.

1a. **Flooding In-depth** (for all states besides territories): Using data from *NOAA's State of the Coast* "Population in the Floodplain" viewer[41] and summarized by coastal county through NOAA's Coastal County Snapshots for Flood Exposure,[42] indicate how many people at potentially elevated risk were located within the state's coastal floodplain as of 2010. These data only reflect two types of vulnerable populations. You can provide additional or alternative information or use graphs or other visuals to help illustrate or replace the table entirely if better data are available. *Note: National data are not available for territories. Territories can omit this question unless they have similar alternative data or include a brief qualitative narrative description as a substitute.*

2010 Populations in Coastal Counties at Potentially Elevated Risk to Coastal Flooding[43]				
	Under 5 and Over 65 years old		In Poverty	
	# of people	% Under 5/Over 65	# of people	% in Poverty
Inside Floodplain	7,798 + 21,079 = **28,877**	(28,877 / 140,292) * 100 = **20.58%**	**22,639**	(23,639 / 140,292) * 100 = **16.85%**
Outside Floodplain	79,608 + 829,262 = **908,870**	(908,870 / 1,206,262) * 100 = **75.35%**	**111,748**	(111,738 / 1,206,262) * 100 = **9.26%**

[41] http://stateofthecoast.noaa.gov/pop100yr/welcome.html
[42] http://www.csc.noaa.gov/digitalcoast/tools/snapshots
[43] To obtain exact population numbers for the coastal floodplain, download the excel data file from the State of the Coast's "Population in Floodplain" viewer.

1b. **Flooding In-depth** (for all states besides territories): Using summary data provided for critical facilities, derived from FEMA's HAZUS[44] and displayed by coastal county through NOAA's Coastal County Snapshots for Flood Exposure,[45] indicate how many different establishments (businesses or employers) and critical facilities are located in the FEMA floodplain. You can provide more information or use graphs or other visuals to help illustrate or replace the table entirely if better information is available.

Critical Facilities in the FEMA Floodplain[44]						
	Schools	**Police Stations**	**Fire Stations**	**Emergency Centers**	**Medical Facilities**	**Communication Towers**
Inside Floodplain	26	3	0	0	1	16
Coastal Counties*	285	29	4	6	25	110

*Data for critical facilities inside the FEMA SFHA 100 year floodplain downloaded from http://coast.noaa.gov/digitalcoast/dataregistry/#/criticalfacilities
*Data for coastal counties obtained via NOAA Quick Report Tool for Socioeconomic Data http://coast.noaa.gov/quickreport/#/index.html

2. Based on the characterization of coastal hazard risk, what are the three most significant coastal hazards[46] within the coastal zone? Also indicate the geographic scope of the hazard, i.e., is it prevalent throughout the coastal zone or are specific areas most at risk?

	Type of Hazard	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Hazard 1	Coastal Storms	Throughout coastal zone
Hazard 2	Geological Hazards	Throughout coastal zone
Hazard 3	Flooding	Throughout coastal zone

3. Briefly explain why these are currently the most significant coastal hazards within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

   In order to prioritize hazard mitigation measures, the 2013 Hawaii State Hazard Mitigation Plan Update provides estimates of the Average Annualized Loss (AAL) for each of the significant natural hazards affecting the State of Hawaii. AAL is an objective measure of future losses averaged on an annual. AALs for each of the significant natural hazards affecting the State of Hawaii are listed in Table 3.0 and serve as the primary justification for the ranking of coastal hazards provided in response to Question 2 above. Additional descriptions of each of the most significant coastal hazards in Hawaii's Coastal Zone are also provided below.

[44] http://www.fema.gov/hazus; can also download data from NOAA STICS http://www.csc.noaa.gov/digitalcoast/data/stics. Summary data on critical facilities for each coastal state is available on the ftp site.
[45] http://www.csc.noaa.gov/digitalcoast/tools/snapshots
[46] See list of coastal hazards at the beginning of this assessment template.

Table 3.0. State of Hawaii Estimated Average Annual Loss

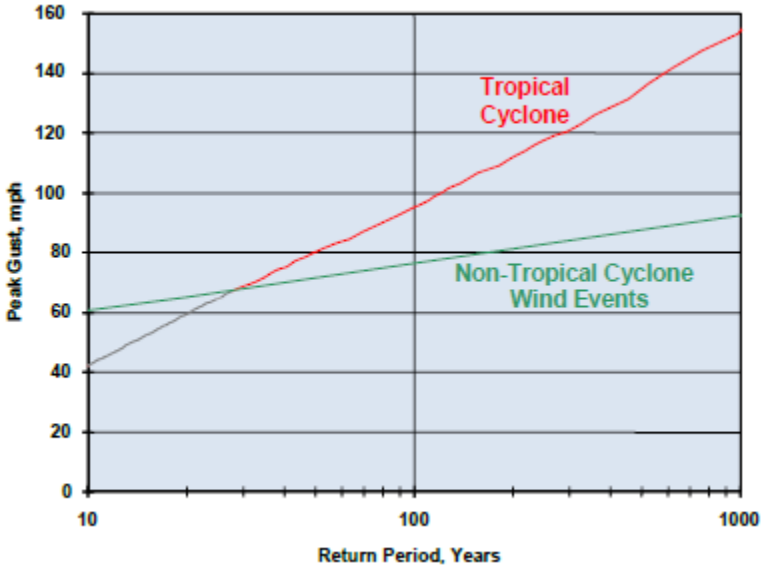
Hazard	AAL
Tropical Cyclone	$390 Million / Year
Tsunami	$168 Million / Year
Earthquake	$106 Million / Year
Lava Flow	$24 Million / Year
Flood	$16 Million / Year
Coastal Erosion	$10 to $11 Million / Year
Debris Flow and Rockfall	$3 to $7 Million / Year

Note: All descriptions of the most significant coastal hazards within Hawaii's coastal zone provided below are adapted from the State of Hawaii Multi-Hazard Mitigation Plan 2013 Update.

Coastal Storms – High Wind Storms

High trade and Kona wind events, distinct from tropical cyclones, affect Hawaii on a relatively regular basis. The *State of Hawaii Multi-Hazard Mitigation Plan 2013 Update* (SHMHMP) includes a comprehensive list of 140 high wind events recorded for over a century (1871-2013). Wind Hazard curves for the Hawaiian Islands (Figure 3.1) show that relatively low wind speeds that occur more frequently are more likely to be from Trade and Kona winds, while relatively high but less frequent wind speeds are more likely to be caused by tropical cyclones. Winds of 68 mph or less, which can still be very damaging, are more likely to occur due to non-cyclonic winds. Greater wind speeds are more likely to be experienced during a tropical cyclone (tropical depression, storm, or hurricane), which are more damaging; however, these events are less frequent.

Figure 3.1 Wind Hazard Curves for the Hawaiian Islands for Hurricane and Non-Hurricane Winds



For example, at the lower wind speeds, a 60 mph or greater trade wind or Kona wind event is expected to occur once every 10 years, while the 60 mph or greater tropical cyclone is expected to occur once every 20 years. At the higher wind speeds, a 90 mph or greater tropical cyclone is expected to occur once every 80 years, while a 90 mph or greater trade or Kona storm is expected to be extremely rare and occur only once every 700-800 years. Therefore, major structural damage due to the high winds is more likely to be caused by tropical cyclones in the form of hurricanes. However, damage associated with storms with lower wind speeds such as minor structural damage for non-conforming structures, non-structural water damage due to windblown rain, flooding associated with wind storms, or damage to non-conforming power distribution systems is more likely to be caused by trade or Kona wind storms.

Coastal Storms – Tropical Cyclones

Due to the dependence of tropical storm activity on ocean water temperature, tropical storm activity in the Pacific is mostly prevalent over the summer months. Most hurricanes in the Central Pacific occur in July through September, reducing in frequency and strength in October through December. An average hurricane season in Hawaii has about four to five tropical cyclones. In the past five years, the Central Pacific has experienced below-average activity due to neutral, or absent, El Niño Southern Oscillation (ENSO) conditions. Eight of the past ten years have been below average.

A list of the hurricanes and tropical storms that are recorded to have had some effect on the islands since 1871 is provided in Table 3.1 below. A summary of significant Hawaiian hurricanes over the last century along with the estimated damage from each hurricane is summarized in Table 3.2 below.

Table 3.1. Historical Tropical Cyclones Affecting the Hawaiian Islands

August 9, 1871	Kohala Cyclone, gale winds
July 31, 1925	Ramage Cyclone
August 18-19, 1938	Mokapu Cyclone
January 23-26, 1948	High winds
August 15, 1950	Hurricane Hika
November 30-31, 1957	Hurricane Nina, gusts to 92 mph.
August 6-9, 1958	Tropical Storm
August 4-7, 1959	Hurricane Dot, strong winds
September 12-19, 1963	Tropical Storm Irah, strong winds
August 8-10, 1967	Tropical Storm
January 8-18, 1971	Tropical Storm Sarah
July 21-22, 1982	Tropical Storm Daniel
August 1, 1982	Tropical Storm Gilma
November, 23, 1982	Hurricane 'Iwa
October 15-20,1983	Hurricane/Tropical Depression Raymond
July 22-23, 1986	Hurricane Estelle, rain and high surf
July 18-20, 1989	Tropical Storm Dalilia
September 11, 1992	Hurricane Iniki, heavy rain, high winds, and high surf
July 16, 1993	Hurricane Fernanda, rain and high surf
July 14, 1994	Tropical Storm Daniel, moderate surf
July 24, 1994	Tropical Storm Fabio, heavy rainfall
August 15, 1999	Hurricane Dora, mild rain
September 1, 2003	Hurricane/Tropical Storm Jimena, 4 to 8-foot swell
August 3, 2004	Hurricane Darby, heavy rain and 4 to 8-foot swell
September 22, 2005	Hurricane/Tropical Storm Jova, 8 to 12-feet swell
September 30, 2005	Hurricane/Tropical Storm Kenneth, 8 to 10-foot swell
August 13, 2007	Hurricane Flossie, rain
August 10, 2009	Hurricane/Tropical Storm Felicia, rain

Table 3.2. Significant Hawaiian Hurricanes of the 20th Century

Name	Date	Damage (1990 Dollars)	Deaths
Mokapu Cyclone	Aug. 19, 1938	Unknown	Unknown
Hiki	Aug. 15, 1950	Unknown	Unknown
Nina	Dec. 2, 1957	$900,000	4
Dot	Aug. 6, 1959	$28,000,000	0
'Iwa	Nov. 23, 1982	$394,000,000	1
Iniki	Sept. 11, 1992	$2,800,000,000	4

All of the Main Hawaiian Islands are at approximately the same risk of a direct hit by a hurricane. Studies including *Windspeed Mapping of Hawaii and Pacific Insular States by Monte Carlo Simulation* (Peterka and Bank, 2002), *Hazard Mitigation Study for the Hawaii Hurricane Relief Fund* (Vickery, 2001), and others by Gary Chock of Martin & Chock, Inc. have been used to estimate the average return period for different category hurricanes in the State of Hawaii and the island of Oahu, as shown in Table 3.3 below.

Table 3.3. Hurricane Annual Odds of Occurrence by Saffir Simpson Category Incorporating NASA and HHRF Sponsored Research and ASCE 7-10

Hurricane Category	Sustained Wind	3-sec. Peak Gust	NASA/HHRF	
			Anywhere in Hawai'i	O'ahu Only
1	74 to 94 mph	90 to 116 mph	1 in 25	1 in 80
2	94 to 110 mph	117 to 134 mph	1 in 50	1 in 320
3 or 4	111 to 156 mph	135 to 189 mph	1 in 75	1 in 400
Any Hurricane	Greater than 74 mph	Greater than 90 mph	1 in 15	1 in 55

In addition, the most recent windspeed hazard curve developed for Hawaii is the 2010 Edition of ASCE 7-10. This hazard curve generally reflects a similar return period to those described in Table 3.3, except for hurricanes of Category 3 or greater which are predicted to be less frequent by the ASCE 7-10 hazard curve with a return period of around 750 years.

Based on an Average Annualized Loss analysis using Hazards United States Multi-Hazard (HAZUS-MH) Software, tropical cyclone AAL for the State of Hawaii is estimated at $390 Million / Year, as shown in Table 3.0 above.

Geological Hazards – Tsunamis

The Hawaiian Islands have a long history of destruction due to tsunamis and are particularly vulnerable to tsunamis originating from Alaska and Chile. Twenty-eight (28) tsunamis with flood elevations greater than 3.3 feet (1 meter) have made landfall in the Hawaiian Islands during recorded history (Table 3.4). Table 3.5 lists tsunami destruction in the State of Hawaii.

Currently, there are no tsunami probabilistic hazard maps for inundation or evacuation of the islands for distant and near source tsunamis; however, the historical frequency of tsunamis with 3.3 feet (1 meter) of run-up is about 1 in 15 years.

Tsunami AAL is estimated at $168 Million / Year, as shown in Table 3.0 above. The annualized loss estimate is generally greater than losses from earthquakes, while being less than anticipated hurricane losses.

Hawaii's direct exposure to tsunami hazard is quantified in Table 3.6 below.

Table 3.4. Tsunamis Affecting Hawaii, 1812-2002

TSUNAMIS AFFECTING HAWAI'I, 1812-2002 (> 1 M RUNUP)										
Yr		Mo	Day	Ms	MM	Runup (m)	Runup (ft)	Runup Station Location	Source	Notes (H=Hawai'i, M=Maui, Mo=Molokai, O=O'ahu, K=Kauai'i)
1812	12/21/1812	12	21			3	10	Ho'okena, Hawai'i	S.California?	1 (H)
1819	4/12/1819	4	12			2	7	W. Hawai'I, Hawai'i	North Coast Chile	1 (H)
1837	11/7/1837	11	7			6	20	Hilo, Hawai'i	South Coast Chile	3 (H,M,O)
1841	5/17/1841	5	17			4.6	15	Hilo, Hawai'i	Kamchatka	3 (H,M,O)
1860	12/1/1860	12	1			3.6	12	Maliko, Maui	N. Pacific?	2 (M)
1868	8/13/1868	8	13			4.5	15	Hilo, Hawai'i	North Chile	6 (H.M.O,K)
1868	10/2/1868	10	2			6.1	20	Kahaualea, Hawai'i	S. Pacific?	1 (H)
1869	7/24/1869	7	24			8.2	27	Puna Coast, Hawai'i	S. Pacific?	2 (H,M)
1871	2/20/1871	2	20	7					Off Lanai?	
1872	8/23/1872	8	23			1.3	4	Hilo, Hawai'i	Aleutians	1 (H)
1877	5/10/1877	5	10			4.8	16	Wai'akea, Hawai'i	N. Chile	8 (H,M,O)
1896	6/15/1896	6	15			5.5	18	Keauhou Landing, Hawai'i	Japan	15 (H,M,K)
1868	4/2/1868	4	2	7.9	XII	13.7	45	Keauhou Landing	Ka'u	many observations
1908	9/21/1908	9	21	6.8	VI	1.2	4	Hilo, Hawai'i	Mauna Loa NE Rift	1 (H)
1919	10/2/1919	10	2	6.1		4.3	14	Ho'opuloa, Hawai'i	South Kona (landslide possibly)	3 (H), Hoopuloa submarine landslide
1926	3/20/1926	3	20			1.5			Off Wailupe, Oahu	
1951	8/21/1951	8	21	6.9	VIII	1.2	4	Ho'okena, Hawai'i	South Kona	
1952	3/17/1952	3	17	4.5	V	3	10	Kalapana, Hawai'i	Kilauea South Flank	1 (H)
1975	11/29/1975	11	29	7.2	VIII	14.3	47	Keauhou Landing, Hawai'i	Kilauea South Flank	many observations (H), 2 deaths/19 injured, **$4.1 million**;
										32 campers at foot of Pu'u Kapukapu - rocks fell pushing
										them to beach where waves started 1) 1.5 m wave,
										2) 7.9 m (26-ft)wave carried campers into crevice/ditch saving
										them from being carried to sea; subsidence 3-3.5 m (11.5ft)Halape
1901	8/9/1901	8	9	7.8		1.2	4	Ho'opuloa, Kailua-Kona, Hawai'i	Vanuatu	
1906	1/31/1906	1	31	8.1		1.8	6	Hilo, Hawai'i	Ecuador	
1906	8/17/1906	8	17	8		3.6	12	Ma'alea, Maui	Chile	
1918	9/7/1918	9	7	8		1.5	5	Hilo, Hawai'i	Kurils	
1922	11/11/1922	11	11	8.1		2.1	7	Hilo, Hawai'i	Chile	
1923	2/3/1923	2	3	8.1		6.1	20	Hilo, Hawai'i	Kamchatka	
1933	3/2/1933	3	2	8.3		3.3	11	Ka'alualu, Hawai'i	Japan	
1946	4/1/1946	4	1	7.1		16.4	54	Waikolu Valley, Moloka'i	Aleutians	159 deaths, **$26 million**, in Hilo (3800 km), 8-m waves,
										every house facing bay washed across st/smashed
1952	11/4/1952	11	4	8.2		9.1	30	Ka'ena Point, O'ahu	Kamchatka	**$0.8-1.0 million**
1957	3/9/1957	3	9	8.1		16.1	53	Kaua'i, Kaua'i	Aleutians	**$5 million**, arr Laie, Oahu (3600 km away) 12ft wave
1960	5/22/1960	5	22	8.5		10.7	35	Hilo, Hawai'i	Chile	61 deaths, **$26.5 million**
1964	3/28/1964	3	28	8.4		4.9	16	Waimea Bay, O'ahu	Alaska	
1965	2/4/1965	2	4	8.2		1.1	4	North Kaua'i, Kaua'i	Aleutians	2 observations on Kaua'I
EQ - NO TSUNAMI										
1983	11/16/1983	11	16	6.6					Kao'iki	Ext damage SE Hawai'i, **>$6 million**
1989	6/25/1989	6	25	6.1					Kalapana	SE Hawai'i, **Almost $1 million**
2011	3/11/2011	3	11	9.0					Honshu, Japan	
						covert m-ft	3.286713			

Table 3.5. Tsunami Destruction in Hawaii

DATE	SOURCE	DEATHS*	WHERE	Run-up**	REMARKS
1837	Earthquake in Chile	16	Hawaiian islands	6 m / 19.6 ft	14 deaths on the Big Island and 2 on Maui.
1868	Earthquake off the Big Island	47	Big Island	13.7 m / 45 ft	The earthquake also caused a landslide in Pahala that killed 37 bringing total deaths to 79.
1877	Earthquake in Chile	5	Hilo	4.8 m / 16 ft	Also 17 injured in Hilo.
1923	Kamchatka earthquake	1	Hilo	6.1 m / 20 ft	Others may have been killed (up to 12 others) and extensive damage occurred in Hilo and Kahului.
1933	Earthquake in Japan	1,600	Japan	3.3 m / 10.8 ft	No deaths in Hawaii but 17 feet waves were reported at Napoopoo.
1946	Earthquake in Aleutian islands	159	Mostly in Hilo (96) but also Kauai (15), Maui (14), & Oahu (9)	16.4 m / 53.8 ft	The largest natural disaster recorded to have occurred in Hawaii.
1952	Kamchatka earthquake	0	Hawaiian islands	9.1 m / 29.9 ft	Damage occurred on Kauai, Maui, Oahu, and in Hilo.
1957	Earthquake in the Aleutian islands	0	Hawaiian islands	16.12 m / 52.8 ft	Caused extensive damage on Kauai.
1960	Earthquake in Chile	61	Hawaiian islands	10.7 m / 35.1 ft	Over 1,000 people died in Chile, Japan, The Philippines, and Hawaii.
1964	Earthquake in Alaska	0	Hawaiian islands	4.9 m / 16.1 ft	106 people died in Alaska and 16 died on the North American coast. Damage occurred in Hilo and Kahului.
1975	Earthquake off the Big Island	2	Halape	14.3 m / 47 ft	19 others were injured.

* For more details see Doak C. Cox, "Tsunami Casualties and Mortality in Hawaii", University of Hawaii, Environmental Center, June 1987.
**Maximum run-up is the greatest height the tsunami was found to reach above the normal shore. The measurements listed are for the highest run-up recorded anywhere in Hawaii for that event (listed in meters and feet).

Table 3.6. Direct Exposure of the Five Western States to Tsunami Hazard

State	Population at Direct Risk (Lower-bound estimates based on present evacuation zones[19,20])	Profile of Economic Assets and Critical Infrastructure
California	275,000 residents plus another 400,000 to 2,000,000 tourists; 840 miles of coastline	>$200 Billion plus 3 major airports (SFO, OAK, SAN) and 1 military port, 5 very large ports, 1 large port, 5 medium ports
	Total resident population of area at immediate risk to post-tsunami impacts:[21] 1,950,000	
Oregon	25,000 residents plus another 55,000 tourists; 300 miles of coastline	$8.5 Billion plus essential facilities, 2 medium ports,1 fuel depot hub
	Total resident population of area at immediate risk to post-tsunami impacts[21]: 100,000	
Washington	45,000 residents plus another 20,000 tourists; 160 miles of coastline	$4.5 Billion plus essential facilities, 1 military port, 2 very large ports, 1 large port, 3 medium ports
	Total resident population of area at immediate risk to post-tsunami impacts[21]: 900,000	
Hawai'i	>200,000 residents plus another 175,000 or more tourists and approximately 1,000 buildings directly relating to the tourism industry; 750 miles of coastline	$40 Billion, plus 3 international airports, and 1 military port, 1 medium port, 4 other container ports, and 1 fuel refinery intake port, 3 regional power plants; 100 government buildings
	Total resident population of area at immediate risk to post-tsunami impacts: 400,000	
Alaska	105,000 residents[20], plus highly seasonal visitor count; 6,600 miles of coastline	>$10 Billion plus International Airport's fuel depot, 3 medium ports plus 9 other container ports; 55 ports total
	Total resident population of area at immediate risk to post-tsunami impacts[2]: 125,000	

Geological Hazards – Earthquakes

Naturally occurring earthquakes in Hawaii can be either of tectonic or volcanic nature. Tectonic, or lithospheric, earthquakes in Hawaii occur at or near the shield volcanoes that form the islands. Twenty-six (26) earthquakes with magnitude 6.0 or greater have occurred in the Hawaiian Islands since the mid-1800s, as shown in Table 3.7 below.

Earthquake AAL is estimated at $106 Million / Year, as shown in Table 3.0 above.

Table 3.7. History of Earthquakes in Hawaii, Magnitude 6.0 and Greater, 1868 - Present

Year	Date	Richter Magnitude	Source / Epicenter
1868	March 28	6.5 – 7.0	Mauna Loa south flank
1868	April 2	7.5 – 8.1	Mauna Loa south flank
1871	February 19	7.0	South of Lānaʻi Island
1908	September 20	6.7	Kīlauea South Flank
1918	November 2	6.2	Kaʻōiki, between Mauna Loa & Kīlauea
1919	September 14	6.1	District, Mauna Loa south flank
1926	March 19	>6.0	NW of Hawaiʻi Island
1927	March 20	6.0	NE of Hawaiʻi Island
1929	September 25	6.1	Hualālai
1938	January 22	6.9	North of Maui Island
1940	June 16	6.0	North of Hawaiʻi Island
1941	September 25	6.0	Kaʻōiki
1948	June 28	4.6	South of Oʻahu Island
1950	May 29	6.4	Kona
1951	April 22	6.3	Lithospheric
1951	August 21	6.9	Lithospheric
1952	May 23	6.0	Kona
1954	March 30	6.5	Kīlauea south flank
1955	August 14	6.0	Lithospheric
1962	June 27	6.1	Kaʻōiki
1973	April 26	6.3	Lithospheric
1975	November 29	7.2	Kīlauea south flank
1983	November 16	6.6	Kaʻōiki
1989	June 25	6.1	Kīlauea south flank
2006	October 15	6.7	Kiholo Bay, Hawaiʻi Island
2006	October 15	6.0	Māhukona, Hawaiʻi Island

Flooding

Major flooding events in Hawaii are caused by rainfall from storms and hurricanes, storm surge, tsunamis, dam failures, and high surf.

Flooding in the State of Hawaii occurs frequently and affects every county. Over time, property damages have been large and many lives have been lost. Increasing development along the scenic coastal areas and shorelines has increased exposure to the risk of flooding and storm surges.

Flooding AAL is estimated at $16 Million / Year, as shown in Table 3.0 above.

4. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed
Sea Level Rise / Climate Change	Assessment of impacts to existing hazards; in-depth Hawaii-specific analysis of solutions.

In-Depth Management Characterization:
Purpose: To determine the effectiveness of management efforts to address identified problems related to the coastal hazards enhancement objective.

1. For each coastal hazard management category below, indicate if the approach is employed by the state or territory and if there has been a significant change since the last assessment.

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Change Since the Last Assessment (Y or N)
Statutes, Regulations, and Policies:			
Shorefront setbacks/no build areas	Y	Y	Y
Rolling easements	N	N	N
Repair/rebuilding restrictions	Y	N	N
Hard shoreline protection structure restrictions	Y	Y	N
Promotion of alternative shoreline stabilization methodologies (i.e., living shorelines/green infrastructure)	Y	N	N
Repair/replacement of shore protection structure restrictions	N	N	N
Inlet management	N	N	N
Protection of important natural resources for hazard mitigation benefits (e.g., dunes, wetlands, barrier islands, coral reefs) (other than setbacks/no build areas)	N	N	N
Repetitive flood loss policies (e.g., relocation, buyouts)	N	N	N
Freeboard requirements	N	N	N
Real estate sales disclosure requirements	Y	N	N
Restrictions on publicly funded infrastructure	N	N	N
Infrastructure protection (e.g., considering hazards in siting and design)	N	N	N
Other (please specify)	N/A	N/A	N/A
Management Planning Programs or Initiatives:			
Hazard mitigation plans	Y	N	N
Sea level rise/Great Lake level change or climate change adaptation plans	Y	N	Y
Statewide requirement for local post-disaster recovery planning	N	N	N
Sediment management plans	Y	N	Y
Beach nourishment plans	N	N	N
Special Area Management Plans (that address hazards issues)	N	N	N
Managed retreat plans	N	N	N
Other (please specify)	N/A	N/A	N/A
Research, Mapping, and Education Programs or Initiatives:			
General hazards mapping or modeling	Y	N	N
Sea level rise mapping or modeling	Y	N	Y

Hazards monitoring (e.g., erosion rate, shoreline change, high-water marks)	Y	N	N
Hazards education and outreach	Y	N	N
Other (please specify)	N/A	N/A	N/A

2. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's management efforts in addressing coastal hazards since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's management efforts?

   An evaluation to determine the effectiveness of Hawaii's management efforts in addressing coastal hazards has not been conducted to date. Any and all information relevant to measuring the impact (i.e., qualitative or quantitative) of all management efforts would facilitate future evaluation efforts.

Identification of Priorities:

1. Considering changes in coastal hazard risk and coastal hazard management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to more effectively address the most significant hazard risks. *(Approximately 1-3 sentences per management priority.)*

   Management Priority 1: Climate Change Adaptation

   Climate change and sea level rise are expected to exacerbate coastal hazard risk in Hawaii. As a result, the State of Hawaii must develop planning and policy options to address existing threatened development and ensure that new development is properly sited outside of vulnerable areas, or designed to mitigate future impacts.

   Management Priority 2: Implementation of the 2013 State of Hawaii Multi-Hazard Mitigation Plan

   In an effort to reduce duplicative efforts, the Hawaii CZM Program finds it a priority to support advancement of the high-priority mitigation actions proposed in the State Disaster Resilience Strategy of the 2013 State of Hawaii Multi-Hazard Mitigation Plan. The hazard mitigation actions included in the 2013 SHMHMP have been evaluated and prioritized by a group of over 60 stakeholders from state and federal agencies, military, county government, utilities, private nonprofit organizations, financial institutions, private sector, academia, and representatives of the State Hazard Mitigation Forum and Hawaii State Earthquake Advisory Committee. The top strategic priority actions include: (1) Update and adopt codes and design standards for tsunami, hurricane, and severe storms; and (2) Produce needed probabilistic design maps for tsunami for application towards mitigation for critical facilities, major buildings, bridges, and key infrastructure such as power plants and ports.

2. Identify and briefly explain priority needs and information gaps the CMP has for addressing the management priorities identified above. The needs and gaps identified here should not be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	**Need?** (Y or N)	**Brief Explanation of Need/Gap**
Research	Y	• Additional Hawaii-specific research on expected climate impacts; • In-depth cost-benefit analysis of potential planning and regulatory solutions is needed to prioritize adaptation efforts; • Multi-hazard risk assessments of public and private critical infrastructure.
Mapping/GIS/modeling	Y	• Update existing historical erosion rate maps for the islands of Kauai, Oahu, and Maui; • Develop historical erosion rate maps for the islands of Niihau, Molokai, Lanai, Kahoolawe, and Hawaii; • Forecast and map coastal erosion and shoreline inundation hazard areas, accounting for projections of sea level rise; • Forecast and map riverine flooding, hurricane, and tsunami hazards, accounting for projections of sea level rise; • Develop probabilistic tsunami design maps for upcoming use with the International Building Code (IBC) / American Society of Civil Engineers (ASCE) 7-16 Standard.
Data and information management	Y	• Dedicated funding for regular data collection; • Guaranteed state and county access to best-available data on climate change and associated coastal impacts; • Consistent use of data in decision-making.
Training/Capacity building	Y	• Guidance for integrating climate change adaptation into existing planning and regulatory frameworks.
Decision-support tools	Y	• Coastal Hazards Assessment tool for use in Special Management Area permitting process.
Communication and outreach	Y	• Public outreach on coastal hazard impacts and alternative response (e.g., soft vs. hard erosion control).
Other (Specify)		

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?
   Yes __X__
   No _____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

   Managing coastal hazards remains a concern for the State of Hawaii. In particular, climate change adaptation has been identified as a high management priority in need of significant investment towards quantifying impacts and implementing reasonable planning and regulatory solutions; however, the HCZMP has decided to defer developing a coastal hazards strategy to advance climate change adaptation until the Interagency Climate Adaptation Committee completes the sea level rise vulnerability and adaptation report for the State of Hawaii in an effort to reduce duplicative, and possibly conflicting, efforts. Instead, the HCZMP proposes to develop a strategy in order to advance implementation of the top two priority actions of the 2013 SHMHMP. The HCZMP contends that the proposed strategy will address Hawaii's high exposure to tsunami risk and constitutes a program change achievable within the five-year funding cycle.

Ocean and Great Lakes Resources

In-Depth Resource Characterization:
Purpose: To determine key problems and opportunities to enhance the state CMP to better address cumulative and secondary impacts of coastal growth and development.

1. What are the three most significant existing or emerging stressors or threats to ocean and Great Lakes resources within the coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout the coastal zone or are specific areas most threatened? Stressors can be land-based development; offshore development (including pipelines, cables); offshore energy production; polluted runoff; invasive species; fishing (commercial and/or recreational); aquaculture; recreation; marine transportation; dredging; sand or mineral extraction; ocean acidification; or other (please specify). When selecting significant stressors, also consider how climate change may exacerbate each stressor.

	Stressor/Threat	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Land-based pollution	Throughout coastal zone
Stressor 2	Ocean Acidification	Throughout coastal zone
Stressor 3	Recreation (competing ocean uses)	Throughout coastal zone
Stressor 4	Protection of Ocean Resources	Throughout coastal zone

2. Briefly explain why these are currently the most significant stressors or threats to ocean and Great Lakes resources within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.

   Land-based pollution, ocean acidification, and recreation are some of the significant stressors to ocean resources within the coastal zone in Hawaii. Proper planning and coordination among agencies with responsibility for management and regulation of the resources and activities that occur within the areas is essential to maintain the health of our coastal and marine resources.

   Land-based pollution such as sediment, nutrients, and other pollutants are transported in surface water runoff and groundwater seepage into coastal waters. One major contributor – cesspools – lack the capacity to treat wastewater before its contact with groundwater, causing contamination into drinking water wells, streams, and the ocean. Cesspools are used more widely in Hawaii than in any other state (U.S. EPA). Other aspects of land-based pollution include sediment from upland areas of the state that are facing erosion from damage from ungulate mammals in the mountainous areas.

   Ocean acidification threatens a wide-range of living marine resources that are essential to maintaining healthy ecosystems along our coasts and in the ocean. Many of the oceans numerous animals and plants with calcium carbonate skeletons or shells have already shown impacts. As mentioned in the Phase I assessment, coral reefs have experienced particularly challenging stresses on their ecosystems across the entire State. Beyond that ecosystem health, indirect effects including the economic benefits from tourism and recreational activities, cultural impacts, and other activities that rely upon healthy marine resources are also affected.

Increasing population and tourism contribute to the increase of participation in outdoor recreation including swimming, stand-up paddle boarding, etc. This increase also reflects potential growth in user conflicts and negative effects on marine ecosystems and fisheries.

3. Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.

Emerging Issue	Information Needed
Competing ocean uses	Threatened, cultural sites, baseline monitoring of natural marine resources
Protection of coastal and ocean resources	Location of natural resources, particularly those residing in State waters

In-Depth Management Characterization:
Purpose: To determine the effectiveness of management efforts to address identified problems related to the ocean and Great Lakes resources enhancement objective.

1. For each of the additional ocean and Great Lakes resources management categories below that were not already discussed as part of the Phase I assessment, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred since the last assessment.

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Ocean and Great Lakes research, assessment, monitoring	Y	N	N
Ocean and Great Lakes GIS mapping/database	Y	Y	N
Ocean and Great Lakes technical assistance, education, and outreach	Y	Y	N
Other (please specify)			

2. For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.
    a. Describe significant changes since the last assessment;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

    Please see Phase I Ocean and Great Lakes Resources (pp 37-44).

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's or territory's management efforts in planning for the use of ocean and

Great Lakes resources since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's or territory's management efforts?

Please see Phase I Ocean and Great Lakes Resources (pp 37-44).

Identification of Priorities:

1. Considering changes in threats to ocean and Great Lakes resources and management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to effectively plan for the use of ocean and Great Lakes resources. *(Approximately 1-3 sentences per management priority.)*

   Management Priority 1: _Coastal Hazards_____

   Description: Coastal hazards remain a high threat to ocean resources in Hawaii. As a result, the State of Hawaii must develop planning and policy options to address existing threatened development and ensure that new development is properly sited outside of vulnerable areas, or designed to mitigate future impacts.

   Management Priority 2: _Coral Reef_____

   Description: Coral reef ecosystems play key roles in marine resources and provide habitat for key fish species. The State has opportunities to reduce anthropogenic effects on near-shore coral reefs and emphasize existing work to focus on place-based management of identified priority sites.

   Management Priority 3: _Ocean Uses_____

   Description: Increasing reliance upon ocean resources coupled with ecological threats such as ocean acidification, fisheries exploitation, and pollution requires intense collaboration between regulatory and natural resource agencies to make informed decisions towards sound policies and plans for more effective planning of ocean resources.

2. Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Research	N	
Mapping/GIS	Y	Marine Managed Areas (MMA) layer updates to continue addressing proper planning of ocean uses with regard for natural resources protection.
Data and information management	Y	Baseline data for natural marine resources in order to most efficiently plan for increasing demand on ocean resources.
Training/Capacity building	N	
Decision-support tools	N	
Communication and outreach	Y	Communication/outreach with State legislators to inform them of the Hawaii Ocean Resources Management Plan and the need to support coordinated efforts among agencies to implement the Plan.
Other (Specify)		

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?
   Yes ___X___
   No _____

2. Briefly explain why a strategy will or will not be developed for this enhancement area.

Yes, a strategy will be developed for this enhancement area to continue the implementation of the Ocean Resources Management Plan (ORMP), the HCZMP's primary vehicle to coordinate State and County activities related to coastal and marine resources. The ORMP is the State's comprehensive planning framework for eleven (11) management priorities that incorporate the majority of the nine (9) enhancement areas for the Section 309 Enhancement Program. Agencies that participate in the ORMP represent parties responsible for aquatic resources, forestry, water quality, ocean recreation, invasive species, etc., and will be key resources in the strategy.

STRATEGY

Probabilistic Tsunami Design Zone Maps for Hawaii

I. Issue Area(s)

The proposed strategy or implementation activities will support the following high-priority enhancement areas *(check all that apply)*:

- ☐ Aquaculture
- ☐ Energy & Government Facility Siting
- ☒ Coastal Hazards
- ☐ Ocean/Great Lakes Resources
- ☐ Special Area Management Planning
- ☐ Cumulative and Secondary Impacts
- ☐ Wetlands
- ☐ Marine Debris
- ☐ Public Access

II. Strategy Description

A. The proposed strategy will lead to, or implement, the following types of program changes *(check all that apply):*

- ☐ A change to coastal zone boundaries;
- ☒ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☐ New or revised local coastal programs and implementing ordinances;
- ☐ New or revised coastal land acquisition, management, and restoration programs;
- ☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ☐ New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

B. ***Strategy Goal:*** _____.

State the goal of the strategy for the five-year assessment period. The goal should be the specific program change to be achieved or be a statement describing the results of the project with the expectation that achieving the goal would eventually lead to a program change. For strategies that implement an existing program change, the goal should be a specific implementation milestone. For example, work with three communities to develop revised draft comprehensive plans that consider future sea level rise or, based on research and policy analysis, present proposed legislation on wetland buffers to state legislature or consideration. Rather than a lofty statement, the goal should be achievable within the time frame of the strategy.

The Hawaii Coastal Zone Management Program seeks to support the development and subsequent adoption of comprehensive high resolution probabilistic tsunami design zone maps for the State of Hawaii for upcoming use with the International Building Code (IBC) 2018 / American Society of Civil Engineers (ASCE) 7-2016 Standard that will include tsunami loads and effects.

C. *Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)*

A U.S. national standard for designing against the effects of a tsunami does not presently exist. As a result, tsunami risk to coastal zone construction is not explicitly addressed in coastal engineering design. To fill this gap, the American Society of Civil Engineers 7 Tsunami Loads and Effects Subcommittee (TLESC) has developed a new and comprehensive chapter for inclusion in the 2016 edition of the ASCE 7 Standard, Minimum Design Loads for Buildings and other Structures. Upon publication of ASCE 7-16 in March 2016, Chapter 6 – Tsunami Loads and Effects will be the first national, consensus-based standard for tsunami resilience for use in the States of Alaska, Washington, Oregon, California, and Hawaii. The new tsunami design provisions will be referenced in the 2018 International Building Code and will apply to a limited class of Risk Category III and IV buildings and structures, as well as taller Risk Category II buildings; the provisions will not apply to low-rise Risk Category II and Risk Category I buildings.

Maps of 2,500-year probabilistic tsunami inundation for Alaska, Washington, Oregon, California, and Hawaii now need to be developed for upcoming use with the IBC 2018 /ASCE 7-16 design provisions. The total national effort necessary for accomplishing the tsunami hazard mapping of the five western states for community risk mitigation through structural design amounts to approximately $400,000, to be completed within a one-year period of performance to which the collaborators have committed. Tasks can be itemized into the following sequential steps, which have already been completed or are in-progress:

- Probabilistic Tsunami Hazard Analysis of Offshore Wave height and associated disaggregated governing scenario definition for input to the national inundation model (Completed);
- Development of general probabilistic design maps for the major populated/developable regions of the five western states based on 90-meter grid of topography (Scheduled for completion by December 2015);
- Development of higher resolution 10-meter probabilistic design maps for reference sites constituting key communities of highest importance in the five western states. (Probabilistic design maps of reference sites in Hawaii are scheduled for completion by March 2016).

Subsequent to the above phases, the five western states will need to develop additional high resolution probabilistic design maps for other coastal areas as needed in accordance with the ASCE 7 Standard for local adoption during the 2018-2019 timeframe when the IBC 2018 is adopted by the states and local county jurisdictions.

Accordingly, the Hawaii CZM Program proposes to complete the fourth and final phase of this multi-phase project by funding the development of high-resolution probabilistic tsunami design zone maps for the State of Hawaii under Years 1-4 of this Section 309 Strategy, and the subsequent adoption of tsunami design provisions as amendments to the State of Hawaii Building Code under Year 5 of this Section 309 Strategy.

III. Needs and Gaps Addressed

Identify what priority needs and gaps the strategy addresses and explain why the proposed program change or implementation activities are the most appropriate means to address the priority needs and gaps. This discussion should reference the key findings of the assessment and explain how the strategy addresses those findings.

Act 82, Session Laws of Hawaii 2007, established the State Building Code Council (SBCC) and a state building code, applicable to all construction in the State of Hawaii. Pursuant to Hawaii Revised Statutes (HRS) Chapter 107 Part II, the state building code shall include tsunami design provisions based on a nationally published standard; however, this statutory requirement has not been fulfilled to date. The HCZMP's proposed strategy will directly address this gap by supporting community risk reduction through the adoption of structural design provisions to address tsunami loads and effects. In particular, the proposed strategy will fulfill the mapping need identified in the assessment to develop high-resolution probabilistic tsunami design zone maps for the State of Hawaii for use with the IBC 2018 / ASCE 7-16 Standard.

IV. Benefits to Coastal Management

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

The proposed strategy falls squarely within the federal and state coastal management objective of reducing the risks to life and property from coastal hazards, including geological hazards such as tsunamis (16 U.S.C. § 1452-2(B); HRS § 205A-2(b)(6)(A)). In particular, the new tsunami design zone maps will define the coastal zones where structures of greater importance would be designed for tsunami resistance and community resilience, ultimately leading to better consideration of siting and design of critical facilities and infrastructure.

V. Likelihood of Success

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change and the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

There is a very high likelihood of attaining the proposed strategy goal and program change during the five-year assessment cycle based on the following:

- The importance of the proposed strategy goal and program change has been recognized by the State Legislature. Upon enacting Act 82, Session Laws of Hawaii 2007, the Hawaii State Legislature found that "the health and safety considerations related to [building codes] are of statewide interest, especially relating to emergency disaster preparedness."
- As mentioned in the description of needs and gaps addressed above, the proposed strategy goal and program change is an unfulfilled statutory requirement. Act 82, Session Laws of Hawaii 2007, established the SBCC and a state building code, applicable to all construction in the State of Hawaii. Pursuant to Hawaii Revised Statutes, Chapter 107 Part II, the state building code shall include tsunami design provisions based on a nationally published standard.

- The authority and duties of the SBCC and individual county governing bodies set forth in HRS Chapter 107 Part II will ensure local adoption of the tsunami design provisions. In particular, building officials appointed by the mayor of each of the four counties must serve on the State Building Code Council subcommittee responsible for recommending any necessary or desirable state amendments to the model codes pursuant to HRS Chapter 107 Part II. Any recommended state amendments shall require the unanimous agreement of the subcommittee. Furthermore, the governing body of each county shall amend the state building code as it applies within its respective jurisdiction without approval for the SBCC. Each county shall use the model codes and standards set forth in HRS Chapter 107 Part II as the referenced model building codes and standards for its respective county building code ordinance, no later than two years after the adoption of the state building code. If a county does not amend the statewide model code within the two-year time frame, the state building code shall become applicable as an interim county building code until the county adopts the amendments. As a result, once the probabilistic tsunami design zone maps and tsunami design provisions are adopted at the state level as administrative rules, they will become the minimum performance objectives acceptable throughout the State of Hawaii.
- The proposed strategy fulfills the second-highest ranked strategic priority called for in the 2013 State of Hawaii Multi-Hazard Mitigation Plan, namely to: "Produce needed probabilistic design maps for tsunami for application towards mitigation for critical facilities, major buildings, bridges, and key infrastructure such as power plants and ports." Completion of the probabilistic tsunami inundation mapping effort and subsequent adoption of tsunami design provisions will implement Strategy Elements #2 and #3 of the State Disaster Resilience Strategy, both of which were independently highly ranked by a broad group of over 60 stakeholders at the 2013 State Disaster Resilience Strategy Workshop organized by the Hawaii Emergency Management Agency (HEMA), formerly known as State Civil Defense;
- The prerequisite tasks necessary for enabling this work have already been completed or are in-progress, as described in the strategy description above;
- The HCZM P has been successful at obtaining similar program changes in recent history, namely the development and adoption of customized wind speed maps and local building code amendments for all four of Hawaii's counties (See Appendix A – *Success Story: Completion of the Hawaii-specific Wind Design Standards and Building Code Project Applicable to All New Construction in the State of Hawaii*);
- The greatest known impediment at this time is the political process involved with the adoption of building codes that is beyond the control of the HCZMP and greater hazard mitigation community; however, the recent Administration transition at the State level coupled with the multitude of recent coastal hazard related disasters worldwide and widespread support for this project should provide a more favorable climate for the adoption of the new tsunami design provisions than in previous years. Additionally, the HCZMP plans to request formal letters of support from relevant state and county agencies and committees in order to demonstrate the widespread endorsement of this project.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps that will lead toward or achieve a program change or implement a previously achieved program change. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. The plan should identify a schedule for completing the strategy and include major projected milestones (key products, deliverables, activities, and decisions) and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual milestones are a useful guide to ensure the strategy remains on track, OCRM recognizes that they may change somewhat over the course of the five-year strategy unforeseen circumstances. The same holds true for the annual budget estimates. Further detailing and adjustment of annual activities, milestones, and budgets will be determined through the annual cooperative agreement negotiation process.

Strategy Goal: The Hawaii Coastal Zone Management Program seeks to support the development and subsequent adoption of comprehensive high resolution probabilistic tsunami design zone maps for the State of Hawaii for upcoming use with the International Building Code 2018 / American Society of Civil Engineers 7-2016 Standard that will include tsunami loads and effects.

Total Years: Five (5) Years
Total Budget: $865,000

Year 1 / Phase 1

- **Description of activities:**
  - Obtain contractual services to complete Phase 1 – Probabilistic Tsunami Design Zone Maps for State of Hawaii;
  - Initiate modeling/mapping for County #1 (City and County of Honolulu).
- **Major Milestone(s):**
  - Executed contract to complete Phase 1;
  - Project workplan for Phase 1.
- **Budget: $185,000**
  - $125,000 (Modeling/Mapping)
  - $60,000 (Principal Investigator)

Year: 2 / Phase 1

- **Description of activities:**
  - Complete modeling/mapping for County #1 (City and County of Honolulu);
  - Conduct independent technical review to ensure compliance with ASCE criteria.
- **Major Milestone(s):**
  - Completion of probabilistic tsunami design zone maps for County #1 (City and County of Honolulu). Deliverables associated with this milestone include:
    - Probabilistic tsunami design zone maps for County #1 that depict inundation depth, extent of flooding, location of tsunami bores;
    - Project geodatabase;

        - User-friendly file format (e.g., Keyhole Markup Language Zipped (KMZ) file) for convenient viewing and editing (e.g., for use with Google Earth and/or Google Maps).

- **Budget: $245,000**
    - $185,000 (Modeling/Mapping)
    - $60,000 (Principal Investigator)

Year 3 / Phase 1

- **Description of activities:**
    - Initiate modeling/mapping for Counties #2 - #4 (Hawaii, Maui, Kauai).
- **Major Milestone(s):**
    - N/A
- **Budget: $185,000**
    - $125,000 (Modeling/Mapping)
    - $60,000 (Principal Investigator)

Year 4 / Phase 1 & 2

- **Description of activities:**
    - Complete modeling/mapping for Counties #2 - #4 (Hawaii, Maui, Kauai);
    - Conduct independent technical review to ensure compliance with ASCE criteria;
    - Obtain contractual services to complete Phase 2 – Adoption of Probabilistic Tsunami Design Zone Maps and Tsunami Design Provisions as Amendments to the State of Hawaii Building Code.
    - Initiate drafting of enabling language and style of maps appropriate for use in State of Hawaii Building Code.
- **Major Milestone(s):**
    - Completion of probabilistic tsunami design zone maps for Counties #2 - #4 (Hawaii, Maui, Kauai). Deliverables associated with this milestone include:
        - Probabilistic tsunami design zone maps for County #1 that depict inundation depth, extent of flooding, location of tsunami bores;
        - Project geodatabase;
        - User-friendly file format (e.g., KMZ) for convenient viewing and editing (e.g., for use with Google Earth and/or Google Maps).
    - Executed contract to complete Phase 2;
    - Project work plan for Phase 2.
- **Budget: $245,000**
    - $185,000 (Modeling/Mapping)
    - $60,000 (Principal Investigator)

Year 5 / Phase 2

- **Description of activities:**
    - Complete drafting of enabling language and style of maps appropriate for use in State of Hawaii Building Code;
    - Present building code amendments for SBCC review and approval;

- Rulemaking in accordance with HRS Chapter 91.

- **Major Milestone(s):**
  - Adoption of building code amendments as administrative rules.

- **Budget: $125,000**

VII. Fiscal and Technical Needs

A. Fiscal Needs: *If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the CMP has made, if any, to secure additional state funds from the legislature and/or from other sources to support this strategy.*

It is estimated that 309 funds will be sufficient to carry out the proposed strategy. Should additional funds be necessary, the HCZMP will seek partnership opportunities with sister State agencies such as the Hawaii Emergency Management Agency, formerly State Civil Defense, in order to leverage 309 funds awarded to the CZM Program under this strategy for the purposes of carrying-out outstanding tasks.

B. Technical Needs: *If the state does not possess the technical knowledge, skills, or equipment to carry out all or part of the proposed strategy, identify these needs. Provide a brief description of what efforts the CMP has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).*

Private engineering, scientific, and research capabilities are necessary to accomplish the probabilistic tsunami design zone maps and building code amendments for the State of Hawaii. These services will be procured in compliance with the Hawaii Public Procurement Code.

VIII. Projects of Special Merit (Optional)

If desired, briefly state what projects of special merit the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank projects of special merit and is simply meant to give CMPs the option to provide additional information if they choose. Project descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not provide detailed project descriptions that would be needed for the funding competition.

The HCZMP proposes to pursue projects of special merit to provide training on the IBC 2018 / ASCE 7-16 Standard for county officials, design professionals, and the building industry sectors of each County.

Ocean Resources Management Planning

IX. Issue Area(s)

The proposed strategy or implementation activities will support the following high-priority enhancement areas *(check all that apply)*:

- ☐ Aquaculture
- ☐ Energy & Government Facility Siting
- ☐ Coastal Hazards
- ☒ Ocean/Great Lakes Resources
- ☐ Special Area Management Planning
- ☐ Cumulative and Secondary Impacts
- ☐ Wetlands
- ☐ Marine Debris
- ☐ Public Access

X. Strategy Description

D. The proposed strategy will lead to, or implement, the following types of program changes *(check all that apply):*

☐ A change to coastal zone boundaries;

☒ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;

☐ New or revised local coastal programs and implementing ordinances;

☐ New or revised coastal land acquisition, management, and restoration programs;

☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,

☐ New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

E. Strategy Goal: *State the goal of the strategy for the five-year assessment period. The goal should be the specific program change to be achieved or be a statement describing the results of the project with the expectation that achieving the goal would eventually lead to a program change. For strategies that implement an existing program change, the goal should be a specific implementation milestone. For example, work with three communities to develop revised draft comprehensive plans that consider future sea level rise or, based on research and policy analysis, present proposed legislation on wetland buffers to state legislature or consideration. Rather than a lofty statement, the goal should be achievable within the time frame of the strategy.*

The goal of the strategy for this enhancement area is to continue to set forth as State policy the importance of managing Hawaii's ocean resources for their economic, environmental, and cultural significance to the State. Specifically, an analysis and update of the Hawaii Ocean Resources Management Plan will provide a basis for proposed legislation to amend the Hawaii State Plan.

F. *Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. If the strategy will only involve implementation activities, briefly describe*

the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)

The proposed strategy is to provide an analysis and update of the 2013 Hawaii Ocean Resources Management Plan. In order to ensure that the Plan remains relevant, timely, and addresses emerging issues, the HCZMP has committed to updating the ORMP every five years. The plan will be analyzed to identify what is working, the constraints and obstacles frequently encountered, and include any emerging issues.

The proposed strategy addresses the achieved program change from previous Section 309 funding (2010-2015) that accomplished support from the State's Executive Branch, encouraging state agency collaborative efforts and participation in the development and implementation of the 2013 ORMP. This strategy continues the State's collaborative efforts to strategically implement the State's priority goals for the management of ocean and coastal resources.

The existing 5-year ORMP set forth a long-term planning period through 2030 and beyond. Currently in the second phase or "adaptation" phase, the ORMP is targeted to "align with National Ocean Policy Plans and Objectives, incorporate key foundational principles of stewardship and ecosystem management, and develop and adopt legal and policy reforms to institutionalize integrated natural and cultural resources management approaches." Each of the four phases is intended to build upon its previous phase and incorporate lessons learned into future ocean resources management.

An update of the Plan is critical to continuing the momentum of this collaborative effort between State and County agencies and its partners from federal and non-governmental agencies to achieve shared vision and goals of the ORMP. The HICZMP will seek endorsement from ORMP agencies to renew and solidify commitments to the State's ORMP.

During the FY2016-2020 cycle, HCZMP will also continue to coordinate the activities of the ORMP to enhance the efforts of coastal zone management issues with HCZMP partner agencies. The eleven (11) management priorities within the Plan provide metrics for implementation and set a strong foundation to identify opportunities for improved coastal zone management. As implementation activities are undertaken, the need for new or amended policies may be identified that may result in enacting and achieving a Program Change.

For example, a sample of goals that may result in a new or revised guidelines include:

- Develop aquaculture standards, based on current scientific data to support culturally, environmentally, and economically sustainable operations which increase production for local consumption,
- Expand options to protect existing developments from further coastal erosion,
- Improve coastal and stream water quality, and
- Promote protection, and sustainable use of marine resources.

XI. Needs and Gaps Addressed

Identify what priority needs and gaps the strategy addresses and explain why the proposed program change or implementation activities are the most appropriate means to address the priority needs and gaps. This discussion should reference the key findings of the assessment and explain how the strategy addresses those findings.

There are many critical needs among the State's ocean resource issues including threats such as pollution from increased land-based development, competing uses of ocean and coastal resources, fisheries depletion, and ocean acidification. The strength of the ORMP is addressing these issues strategically as a state by coordinating activities and utilizing existing relationships among agencies to develop a concerted effort to address these threats.

The ORMP has already demonstrated successful collaboration through both the Council on Ocean Resources and the Coordinated Working Group. Further, the 2013 ORMP identified eleven (11) management priorities for the State, and subsequent goals and metrics to measure the progress of its implementation. This process allows for the development of baseline monitoring and trends for each of the metrics within the Plan.

As the ORMP moves forward with implementation, an update of the Plan will analyze its progress and identify the strengths of where coordination is working well to implement aspects of the ORMP, and more importantly, identify where coordination needs to be improved upon to achieve the goals. The update will also seek to identify the obstacles - funding and otherwise – that agencies face for goal implementation and present options to address these.

Identifying obstacles will help to provide a more strategic path towards continued implementation of the ORMP into the next planning period. This will enable agencies to create realistic expectations for achievable outcomes, and create opportunities to leverage resources among agencies to collaborate on shared goals.

XII. Benefits to Coastal Management

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

The analysis of the 2013 Ocean Resources Management Plan and actions taken within the 5-year period will better inform the ORMP network agencies on the effectiveness of their respective roles and responsibilities in the Plan. Outcomes from the analysis will help to refine the direction of the next phase of the ORMP planning process.

Identification of obstacles for implementation will better position the network to plan for near-term and long-term goals for the management of ocean and coastal resources. By identifying these specific challenges, agencies can focus on directing immediate efforts towards more achievable aspects of the ORMP and develop a long-term path towards addressing more complicated challenges.

Updating the ORMP will ensure that the Plan is inclusive of the most relevant issues within the identified eleven (11) management priorities.

XIII. Likelihood of Success

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change and the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

The likelihood for success for this project is high because the project will build upon existing work and collaboration between state, federal, county agencies, and the Marine and Coastal Zone Advisory Council through the partnerships of the ORMP. With over 9 years of collaboration, this project benefits from the momentum of existing relationships, successful project implementation, and a shared vision.

Agencies are committed to implementation of the ORMP through the Hawaii Ocean Partnership which was adopted in 2013. This commitment is a strong indicator for dedication of staff resources to participate in the ORMP, therefore, it is highly likely that this strategy will meet with success.

XIV. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps that will lead toward or achieve a program change or implement a previously achieved program change. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. The plan should identify a schedule for completing the strategy and include major projected milestones (key products, deliverables, activities, and decisions) and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual milestones are a useful guide to ensure the strategy remains on track, OCRM recognizes that they may change somewhat over the course of the five-year strategy unforeseen circumstances. The same holds true for the annual budget estimates. Further detailing and adjustment of annual activities, milestones, and budgets will be determined through the annual cooperative agreement negotiation process.

Strategy Goal: The goal of the strategy for this enhancement area is to analyze the implementation of the 2013 Hawaii Ocean Resources Management Plan, assess its effectiveness as a Statewide plan for ocean and coastal resource management, identify obstacles for the implementation of the plan, and prepare an updated version of the plan for the next planning period.
Total Years: 1.5
Total Budget: $280,000

Year(s): 1
Description of activities: Identification of further collaboration opportunities to further demonstrate the success of partnerships under the ORMP.
Major milestone(s): Implementation projects to further the 2013 ORMP
Budget: $10,000

Year(s): 2
Description of activities: Analyze and update the ORMP, further refine metrics, address emerging issues, solicit stakeholder input and reassess the relevancy of the 2013 ORMP.

1. Obtain contractual services to assist with Tasks 2 through 4 below:

2. Conduct analysis of the ORMP, metrics, its implementation, including constraints (financial and otherwise), obstacles, and gaps; prepare draft revisions to the ORMP by gathering input from, and holding facilitated discussions with, the following:
    a. ORMP Coordinated Working Group
    b. ORMP Council on Ocean Resources
    c. MACZAC
    d. Individual implementing government agencies and programs; and
    e. Other ORMP stakeholder groups.
3. Conduct in-depth interviews with State and county agencies to identify obstacles for implementation of the ORMP.
4. Facilitate and support ORMP Coordinated Working Group and Council on Ocean Resources meetings to obtain input on addressing obstacles.

Major Milestone(s): Report identifying and analysis of the obstacles for implementation of the ORMP.
Budget: $100,000

Year(s): 3-4
Description of activities: Further refine metrics, address emerging issues, solicit public input and prepare updated version of the ORMP

1. Obtain contractual services to assist with Tasks 2 through 8 below:
2. Prepare draft revisions to the ORMP, and obtain input from the following groups:
    a. ORMP Coordinated Working Group
    b. ORMP Council on Ocean Resources
    c. MACZAC
    d. Individual implementing government agencies and programs; and
    e. Other ORMP stakeholder groups.
3. Schedule, organize and conduct First Round of statewide public listening sessions to obtain input on ORMP implementation, to identify emerging issues, and needed revisions to the ORMP
4. Revise Draft 1 of the ORMP after public listening session feedback is obtained.
5. Present revised Draft 2 of the ORMP to ORMP Coordinated Working Group
6. Schedule, organize and conduct Second Round of statewide public listening sessions to obtain input on revised Draft 1.
7. Present Draft 2 ORMP to ORMP Council on Ocean Resources for endorsement.
8. Prepare Final Updated ORMP.

Major Milestone(s): Completion of an updated Ocean Resources Management Plan.
Budget: $180,000

Year(s): 5
Description of activities: Identification of further collaboration opportunities to further demonstrate the success of partnerships under the ORMP.
Major milestone(s): Implementation projects to further the 2013 ORMP
Budget: $10,000

XV. Fiscal and Technical Needs

A. **Fiscal Needs:** *If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the CMP has made, if any, to secure additional state funds from the legislature and/or from other sources to support this strategy.*

It is anticipated that Section 309 funding will be sufficient to carry out the proposed strategy for this enhancement area.

B. **Technical Needs***: If the state does not possess the technical knowledge, skills, or equipment to carry out all or part of the proposed strategy, identify these needs. Provide a brief description of what efforts the CMP has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).*

The state possesses the technical knowledge and skills to carry out the proposed strategy.

XVI. Projects of Special Merit (Optional)

If desired, briefly state what projects of special merit the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank projects of special merit and is simply meant to give CMPs the option to provide additional information if they choose. Project descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not provide detailed project descriptions that would be needed for the funding competition.

5-Year Budget Summary by Strategy

At the end of the strategy section, please include the following budget table summarizing your anticipated Section 309 expenses by strategy for each year.

Strategy Title	**Year 1 Funding**	**Year 2 Funding**	**Year 3 Funding**	**Year 4 Funding**	**Year 5 Funding**	**Total Funding**
Probabilistic Tsunami Design Zone Maps for the State of Hawaii	185,000	245,000	185,000	245,000	125,000	985,000
Ocean Resources Management Planning	10,000	100,000	90,000	90,000	10,0000	300,000
Total Funding	**195,000**	**345,000**	**275,000**	**335,000**	**135,000**	**1,285,000**

SUMMARY OF STAKEHOLDER AND PUBLIC COMMENT

The HCZMP solicited input for the Section 309 Enhancement Program Assessment from its network of representatives from state agencies, county planning agencies, federal agencies and non-profit agencies that frequently work with the Program. An email list was created to include the names of 88 stakeholders.

An online survey was created and sent via email to the 88 recipients. A total of 15 responses were received. Stakeholders were asked to respond to questions which were adapted from the CZMA Section 309 Program Guidance: 2016 to 2020 Cycle, Appendix F. The nine enhancement areas were provided for their reference. The questions are listed below:

- What is your affiliation with the Hawaii Coastal Zone Management Program i.e. Agency/Organization name?
- Of the nine (9) enhancement areas, indicate which you feel are the highest priority for the state's coastal zone management program. Please type the top three (3) in order of priority. Briefly explain your selection(s) of these three enhancement areas.
- What do you feel are the most important issues regarding these top priority enhancement areas?
- What are the greatest opportunities for enhancing the state's coastal management program to more effectively address these problems?
- Do you have any additional comments or suggestions for the Hawaii CZM Program?

Briefly summarize the relevant feedback received that is useful for informing the development of the assessment and strategy i.e. any common or perhaps divergent ideas and priorities that emerged

For the survey period of December 8 – December 15, 2014, 15 responses were received. Of the nine enhancement areas, coastal hazards rose to the top as the area of highest priority for the surveyed stakeholders. Key themes for the challenges within this enhancement area included the high risk of exposure that the state experiences from high waves, storms, and tsunami risks, particularly when exacerbated by the increasing threats of sea level rise and effects of climate change. Challenges identified in this area included lack of information available to understand potential impacts and identifying reasonable preventative measures. Feedback from the survey will help to inform the coastal hazards enhancement area program strategy.

Special area management planning (SAMP) and public access also ranked highly as identified priorities among the enhancement areas. Special area management planning was identified as an area of importance particularly to protect natural resources from threats such as land based pollution and/or development. However, many of the comments received were less related to special area management planning, and more directly related to the HCZMP special management area (SMA) regulatory processes. The survey could have done a better job in explaining that SAMP and SMA are different management tools. Public access was stressed as a valuable resource of which coastal hazards and user conflicts have contributed to management challenges for beach and shoreline access.

APPENDICES

Appendix A

Success Story:

Completion of the Hawaii-specific Wind Design Standards and Building Code Project Applicable to All New Construction in the State of Hawaii

HICZMP has successfully completed the above-named project, which spanned the nine-year period from June 2005 – October 2014. Major project goals were to: (a) build resilient communities by adoption of the latest building codes that include state-of-the-art standards for coastal hazard mitigation specific to each of the State's four counties, and (b) provide technical support to state and county officials and building industry professionals on the application and interpretation of these building codes. Project highlights by year follow:

2006: County of Hawaii wind design maps, standards, and code provisions completed under HICZMP contract. (306)

2007:

- Act 82, Session Laws of Hawaii establishes the State Building Code Council (SBCC). HICZMP co-drafts the legislation which mandates state adoption of the latest building codes (International Codes) and which specifically requires inclusion of hurricane, tsunami, and flood design standards into the codes.
- HICZMP initiates statewide training in the International Codes (including building, residential, existing, structural, nonstructural, plan reviews, building inspection, transition to the International Codes, mixed occupancies, architectural design, earthquake-resistant design, post-earthquake building inspections, and Hawaii-specific wind design). HICZMP offers training to the public and private sectors in all counties over the seven-year period of 2007-2014. (306, 309)

2008: County of Maui wind design maps, standards, and code provisions completed under HICZMP contract. (309)

2009:

- The American Society of Civil Engineers (ASCE) 7 Standards Committee revises the 2005 Edition of ASCE 7 by designating the State of Hawaii as a Special Wind Region. This designation represents a national acceptance of the technical accuracy of the Hawaii wind design standards and recognizes that for Hawaii, those standards supersede the more generalized national wind standards.
- Honolulu City Ordinance No. 07-022 (International Building Code with Hawaii wind design standards) are incorporated into the HICZMP as *enforceable policies*, March 12, 2009.

2010:

- SBBC adopts the Hawaii State Building Code as administrative rules; i.e., *enforceable policies*, (Hawaii Administrative Rules, Title 3, Subtitle 14, Chapter 180 State Building Code). Appendix W of the Code consists of the Hawaii wind design standards developed through Section 306 and

309 funds and FEMA hazard mitigation grant funds. Through this adoption, the most relevant and current building and hazard mitigation science were incorporated into law and practice for all new state buildings.

- The wind design standards developed by this project, along with those funded by FEMA for Honolulu and Kauai counties and adopted in Hawaii State Building Code, receives the 2010 American Society of Civil Engineers Hawaii Section Outstanding Civil Engineering Achievement (OCEA) Award. The OCEA Award is the highest recognition given to a Hawaii civil engineering project. It also was selected as ASCE's Best Study and Research Project for 2010.

2012: All four counties in the State of Hawaii have adopted the wind-design standards specific to their county, as generally contained in Appendix W of the State Building Code, i.e., *enforceable policies*. The legal effect of these adoptions is that the standards of Appendix W now apply to all new construction of commercial, government, and residential structures in all counties of the State of Hawaii.

2013:

- Hawaii Administrative Rules, Title 3, Subtitle 14, Chapter 180 State Building Code (with Hawaii-specific wind design standards) are incorporated with qualification into the HICZMP as *enforceable policies*, January 13, 2013.
- The International Code Council publishes the *Guide to the Wind Design Provisions of the Hawaii State Building Code* as a comprehensive technical reference for architects, engineers, construction industry suppliers and contractors, and building officials. (306)
- The goals and objectives of the *2013 Update to the State of Hawaii Multi-Hazard Mitigation Plan* (SMHMP) include the protection of life, property, and structures through updated building codes and standards, and training in the building codes. Thereby, the coastal hazard mitigation and building code projects and policies of the HICZMP are fully integrated elements of the SMHMP.

2014: Statewide training in the wind design provisions take place throughout the State, reaching approximately 336 public and private sector building officials on the federal, state, and county levels, design professionals (architects and engineers), and the construction industry. The *Guide to the Wind Design Provisions of the Hawaii State Building Code* is provided to each participant as the reference textbook. (306)

In conclusion, this project significantly improves building performance under hurricane-force winds and thus reduces the risks to life and property throughout the State of Hawaii. The enacted building codes are a critical factor in receipt of federal disaster public assistance aid, as post-disaster federal aid will allow the State to rebuild in conformance to our state-of-the-art disaster-resistant building code. The overarching framework of the State Building Code law provides a streamlined and collaborative process to facilitate future improvements to the State and county building codes. That, and the relevant goals and objectives of the 2013 SMHMP, ensure that the results of this project will continue to be refined, added to, and implemented far into the future.